

Biological Assessment
Threatened, Endangered, and Forest Service Sensitive Species
Orleans and Ukonom Ranger Districts
Somes Bar Integrated Fire Management Project

Klamath Province
Six Rivers National Forest

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I. INTRODUCTION

The Somes Bar Integrated Fire Management Project area encompasses ~5,570 acres of National Forest System (NFS) lands administered by the Orleans/Ukonom Ranger District in Township 11 North, Range 6 East, Sections 5 and 6; Township 12 North, Range 6 East, Sections 2, 3, 4, 9, 10, 11, 14, 15, 16, 19, 20, 21, 30, 29, 31, 32 and 33; Township 14 North, Range 6 East, Sections 34 and 35; and Township 13 North, Range 6 East, Sections 3, 4, 5, 8, 9, 17, 20, 21, 22, 27, 28, 29, 32 and 33; Humboldt Meridian, California (See Figure 1-2 in Chapter 1 of the EA).

The purpose of this Biological Assessment (BA) is to evaluate the effects of the **Somes Bar Integrated Fire Management Project** on the habitat and continued existence of Endangered, Threatened, and Forest Service (FS) Sensitive (TESP) wildlife species that may be affected by activities occurring within the project area. The BE is the project record for Forest Sensitive Species and the Karuk Tribe Traditional Ecological Knowledge (TEK) Focal Species. This BA is prepared in accordance with legal requirements set forth under section 7 of the Endangered Species Act [ESA; 19 U.S.C. 1536 (c)], and follows the standards established in Forest Service Manual direction (FSM 2672.42) (USDA-FS 1991). This document provides the analysis of effects that would occur from implementing the Preferred Alternative (Alternative 2).

The analysis is based on the best scientific and commercial data available at the time this document was written. This includes information such as data collected from Forest databases, remote sensing vegetation analysis, field surveys, the most recent and appropriate scientific research or species information, and direct observation on site visits to the project area.

This BA incorporates the information from the Forest-wide Reference Document for Biological Assessment/Evaluations (January 18, 2018, **Appendix A**). The Reference Document contains current management direction, species life history and habitat requirements information (on which effects of proposed projects are evaluated), and literature cited. The Reference Document is updated periodically as species status or other information changes.

LIST OF SPECIES CONSIDERED

The Six Rivers National Forest (SRNF) accessed the most recent list of endangered, threatened, or proposed species that may occur in the vicinity of the project from the US Fish and Wildlife Service (USFWS) web site (IPaC) dated November 1st, 2017. (Consultation Code: 08EACT00-2018-E-00064 – AFWO) (Information summarized in Table 1).

Table 1. Federally listed species derived from the species portal lookup on the USFWS website (IPaC Trust Resource Report) on November 1, 2017 for the Somes Bar Integrated Fuel Management Project area.				
Wildlife Category	Common Name	Scientific Name	Status	Critical Habitat
Crustaceans	Conservancy fairy shrimp	<i>Branchinecta conservation</i>	E	Y
	Vernal pool tadpole Shrimp	<i>Lepidurus packardi</i>	E	Y
	Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	T	Y
Birds	Marbled murrelet	<i>Brachyramphus marmoratus</i>	T	Y

Table 1. Federally listed species derived from the species portal lookup on the USFWS website (IPaC Trust Resource Report) on November 1, 2017 for the Somes Bar Integrated Fuel Management Project area.

Wildlife Category	Common Name	Scientific Name	Status	Critical Habitat
	Yellow-billed cuckoo	<i>Coccyzus americanus</i>	T	Y
	Western snowy plover	<i>Charadrius alexandrinus nivosus</i>	T	Y
	Northern spotted owl	<i>Strix occidentalis caurina</i>	T	Y
Mammals	gray wolf	<i>Canis lupus</i>	E	N

Status = Threatened (T), Endangered (E), or Candidate (C). Critical habitat = Yes (Y), no (N), or proposed (P).

*Species covered under the National Marine Fisheries Service are covered under the Fisheries Biological Assessment and are therefore not covered in the terrestrial wildlife BA.

Critical Habitat for the vernal pool fairy shrimp was designated on August 11, 2005.

Critical Habitat (revised) for the northern spotted owl was designated on December 4, 2012.

One federally-listed Threatened species is known to occur within the action area (northern spotted owl).

Species Dropped from Detailed Discussion

Conservancy Fairy Shrimp (*Branchinecta conservatoria*), **Vernal pool fairy shrimp** (*Branchinecta lynchi*) and **Vernal pool tadpole shrimp** (*Lepidurus packardii*) - The action area is outside the range of Conservancy fairy shrimp and vernal pool tadpole shrimp and does not contain suitable habitat for vernal pool fairy shrimp. Therefore, this project will have “**no effect**” on these species.

Marbled Murrelet (*Brachyramphus marmoratus*) Within the Somes Bar Integrated Fire Management Project area radar and audio-visual surveys have been conducted with no detections. Redwood Sciences Lab conducted the audio-visual surveys west of the Somes Bar Integrated Fire Management Project area in 2008. In 2010 and 2011, a radar study was conducted on SRNF which included the ridge west of Bluff Creek drainage on the Orleans Ranger District and west of and the Somes Bar Integrated Fire Management Project Areas. At radar survey stations OR26-28, OR27-27, OR27-26, OR31-24 and OR31-23 on Forest Route 13 on the ridge west of Bluff Creek, the five stations did not detect marbled murrelets or murrelet-like targets (Tables 4 and 5 in Blaha and Cooper, 2011). There were no audio-visual observations of murrelets during these surveys in 2010 or 2011. Within the Donahue focal area, aural and visual surveys conducted in 2015 and 2016, there were no detections. . The Somes Bar Integrated Fire Management Project area is located approximately 28 miles east of the Pacific Ocean (straight line) in habitats that is not likely suitable for nesting. The Donahue focal area and existing vegetation would get very hot during the summer months. In addition, the Somes Bar Integrated Fire Management Project does not contain critical habitat. Therefore, this project will have “**no effect**” on this species or its critical habitat. MAMU will not be discussed further in this document.

Yellow-billed Cuckoo (*Coccyzus americanus*) – The cuckoo is strongly associated with dense riparian vegetation typically composed of woodlands with low, scrubby, dense vegetation and surface water. In some areas of the species range, the cuckoo can be found in willow thickets or dogwood patches. On the Forest, cuckoo habitat is more likely to occur in small areas along the Klamath River; the closest known detections were located near the mouth of the Smith River and

near the mouth of the Eel River. The project will not modify habitat nor disturb potentially nesting cuckoo thus the project will have “**no effect**” on cuckoo. In addition, the Six Rivers National Forest doesn’t contain any proposed cuckoo critical habitat. Therefore, this project will have “no effect” on cuckoo or its critical habitat and will not be further discussed in this document.

Western Snowy Plover (*Charadrius alexandrinus nivosus*) - The Somes Bar Integrated Fire Management Project and action area is outside the range and does not contain habitat for this species. Therefore, this project will have “**no effect**” on this species.

Gray wolf (*Canis lupus*) – The gray wolf was added to the FWS I_PAC species list for the Six Rivers National Forest after the GPS-collared wolf known as OR-7 dispersed from Oregon into California, but OR-7 has returned to Oregon. While OR-7’s dispersal event suggests that unmarked wolves may occur in California without our knowledge, OR-7 was the first recorded wolf in California since 1924. OR-7 was never recorded to have interacted with potential unmarked individuals in California. Additionally, OR-7’s GPS data, although limited due to time span between locations, did not cross through or near the project area. OR-7 has successfully denned and produced offspring in Southern Oregon. The second known wolf den (Shasta Pack) was observed near Mt Shasta >100 miles from the project area. In 2017 a new pack has successfully reproduced in the Lassen National Forest also >100 miles from the project area.

Although gray wolf is not known to occupy the project area, the species could occur in or near the project area and not yet be detected. If a wolf were present in the project area, it would be most likely a dispersing individual. Wolves are generalist predators and if present in the project area, a wolf could find enough food to survive. Despite many reported observations of wolves in recent years made to the California Department of Fish and Wildlife, there has been no confirmed presence of the species, no den sites and no rendezvous sites recorded anywhere in or near the project area. If a wolf was present in the project area, the wolf would likely not be near any project activity that may create measurable effects to the species. Therefore, we conclude the project will have “**no effect**” on the gray wolf and will not be further discussed in this document.

However, if a wolf is found in the project area, the Forest will contact FWS and determine whether consultation is necessary.

II. Consistency with Recovery Plans and Other Management Direction

The Somes Bar Integrated Fire Management Project is located on two National Forests. For additional management direction, see the Six Rivers National Forest (SRNF) Land and Resources Management Plan (LRMP), Klamath National Forest (KNF) LRMP, and the SRNF Forest-wide Reference Document.

Northwest Forest Plan (NWFP): The NWFP was adopted in 1994 to guide the management of more than 9.7 million hectares (24 million acres) of Federal Land in portions of western Washington, Oregon, and northwestern California within the range of the Northern spotted owl (NSO). The KNF and SRNF Plans incorporate the NWFP and is intended to provide the basis for conservation of the NSO and other late-successional and old-growth forest associated species. The Plans incorporate the NWFP into both Forest Plans and the standards and guidelines in these plans reflect the components of the NWFP.

NSO Critical Habitat Rule: In the 2012 designation of NSO critical habitat, the U.S. Fish and Wildlife Service developed management suggestions for managing within critical habitat. These suggestions included conserving high quality habitat and actively managing forests to restore ecosystem health such as natural fire regimes. The Somes Bar Integrated Management Project is located in the Western Klamath critical habitat subunit and this subunit is considered a ‘fireprone’ management area because of its fire return intervals and existing condition (USDI Fish and Wildlife Service 2008, 2012). Within fire-prone areas, resource agencies planning vegetation management in Critical Habitat for the NSO are encouraged to ameliorate current threats of ongoing habitat loss from uncharacteristic fires and vegetation change due to past fire exclusion (USDI Fish and Wildlife 2008 pp. 47349-47350). Resource agencies are also encouraged to work toward maintaining or enhancing the characteristics of older forest and provide large habitat blocks associated interior forest conditions. Regional variations should be taken into account: in the Western Klamath this means providing mosaics of interior habitats and edges to provide for the diversity of prey for NSO. Management activities that contribute to recovery goals through risk reduction such as the removal of ground and ladder fuels, and the restoration of ecosystem processes that lead to the development or replacement of spotted owl habitat are recommended. The project design of the Somes Bar Integrated Fire Management Project are consistent with these recommendations by the focus of thinning ladder fuels, removal of ladder fuels around residual predominant and dominate trees, and the reintroduction of low intensity prescribed fire.

NSO Recovery Plan: On June 28, 2011, the FWS released the *Revised Recovery Plan for the Northern Spotted Owl (Strix occidentalis caurina)*. The purpose of recovery plans is to describe reasonable actions and criteria that are considered necessary to recover a listed species. The 2011 Revised Recovery Plan (RP) for the Northern Spotted Owl represents the “best available science.” The 2011 RP recognizes the importance of maintaining, and restoring, habitat for the recovery and long-term survival of the spotted owl. The 2011 Recovery Plan relies on Federal lands to provide the major contribution for recovery (USDI Fish and Wildlife Service 2011).

The RP for the NSO was prepared by a Recovery Team consisting of Federal agencies, State governments, Private Land Managers, and other interested parties. The Revised RP published on June 28, 2011 replaced the 1992 Draft RP, which had been used as a foundation for the 1994 Northwest Forest Plan.

The 2011 Revised RP identifies three main threats to NSO (current and past habitat loss and competition with barred owls) and describes a Recovery Strategy which includes habitat conservation and active forest management as necessary steps to addressing these threats. The RP also identifies physiographic provinces as Recovery Units, and offers recommendations that are specific to some of these Recovery Units. Recovery Actions listed in Table 2 apply to the Somes Bar Integrated Fuel Management Project.

Table 2: Recovery Actions Applicable to the Somes Bar Integrated Fire Management

Project		
Recovery Action	Description	Applicable Recommendations
6	<i>'In moist forests managed for spotted owl habitat, land managers should implement silvicultural techniques in plantations, overstocked stands and modified younger stands to accelerate the development of structural complexity and biological diversity that will benefit spotted owl recovery.'</i>	<p>Intent of this recovery action is to design projects that would apply ecological forestry principles. The treatments should emphasis creating healthy resilient forests, reduce competition, re-introduce fire, and increase stand heterogeneity and the development of structural complexity in plantations or overstocked stands.</p> <p><i>Action: The Somes Bar Integrated Fire Management Project is designed to restore and accelerate development of important habitat characteristic for the spotted owl. The project proposes to treat plantations and overstocked stands that, if treated, will increase the available habitats for the spotted owl including providing openings for prey species. Predominate and dominate trees will not be cut and fire will be reintroduced on the landscape. The lack of natural mixed-severity fires in the landscape retains a continuum of stand homogeneity and limits a primary process which results in the formation of unique habitat features (basal hollows, snags etc.) and stand diversity. Treatment of the proposed stands will have an immediate benefit to the spotted owl.</i></p>
10	<i>Conserve spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl population</i>	<p>Intent of this recovery action is to protect, enhance, and develop habitat in the quantity and distribution necessary to provide for the long-term recovery of spotted owls.</p> <p><i>Action: Project design standards will be managed to maintain and Improve habitat stand conditions inside and outside known NSO home ranges for short and long-term; habitat modification will not preclude NSO use and significant impacts are not expected to habitat or individuals. Proposed treatments were designed to minimize effects to existing habitat and promote stand development throughout the treatment areas. The proposed treatments provide for long term improvement to the habitat by removing fuels and consequently reducing the potential of high severity fire moving across the treatment into existing NSO habitat.</i></p>
32	<i>Federal and non-federal landowners should work with the Service to maintain and restore older and more structurally complex multi-layered conifer forests ...allowing for other threats, such as fire and insects to be addressed by restoration management actions.</i>	<p>Maintaining forests with high-quality habitat will provide additional support for reducing key threats faced by NSO; protecting these forests should provide NSO high-quality refugia habitat from negative competitive interactions with barred owls that are likely occurring where the two species' home ranges overlap.</p> <p><i>Action: High quality nest/roost spotted owl habitat and known NSO nest groves meeting intent of RA32 have been identified within the project area. Commercial treatments will not occur in these stands. Within nest groves proposed treatments include ≤ 4" cut, pile and burn along ingress and</i></p>

Table 2: Recovery Actions Applicable to the Somes Bar Integrated Fire Management Project		
Recovery Action	Description	Applicable Recommendations
		<i>egress roads and along private property boundaries. In high quality nest/roost habitat polygons proposed treatments include ≤ 4" cut, pile and burn and/or low intensity underburning. These fuels treatments will contribute to the overall prevention of stand replacing fire within areas of high quality habitat through the strategic placement of fuel breaks and prescribed fire. Hazard tree removal is occurring in all habitat types but is necessary for human health and safety.</i>

The Somes Bar Integrated Fuel Management Project would protect all high quality habitat (not just old-growth, but also late mature and some mid mature stands, RA32), all spotted owl territories (not just high priority sites, RA10) and is designed to restore and accelerate important habitat characteristic for the spotted owl (RA6) in young overstocked stands. Such long-term protection of owl habitat is consistent with the recommendations in the 2011 Recovery Plan.

Forest-wide Late-Successional Reserve Assessment (LSRA). The Klamath National Forest Forest-wide Late-successional Reserve Assessment (1999) sets the objective that Fuels Management Treatments effects in LSRs must be neutral and should have a long-term positive effect on late-successional habitat. Proposed project treatments should not diminish suitable habitat now or in the future.

III. CONSULTATION TO DATE

The Somes Bar Integrated Fuel Management Project was introduced to the Six Rivers/USFWS Section 7 Streamline Consultation Level One team on April 7, 2015. General overview of the proposed action, habitat conditions, and distribution of known NSO territories were discussed at this meeting. Within the project area we used the NSO habitat layer 2007 EVEC, ortho imagery, field verification, and hand typing to create the final NSO habitat layer for the project.

U.S. Fish and Wildlife, Arcata Field Office Biologists, John Hunter, Katherine Siedel, have had involvement with this project including public meetings, interdisciplinary team meetings, and coordinated field trips with USFS biologists and USFS planners (See table 3 below).

The California Natural Diversity Database (CNDDB) was accessed on November 1, 2017 to verify NSO activity centers and survey history. The CNDDB survey data was incorporated into this analysis.

To meet its procedural obligation, the agency action must first determine whether its proposed discretionary action may affect a listed species or a Critical Habitat 50 C.F.R. § 402.14(a). If an

agency determines that an action “may affect” listed species or Critical Habitats, formal consultation is ordinarily mandated. *Natural Resources Defense Council v. Houston*, 146 F.3d 1118, 1126 (9th Cir. 1998) (citing *Thomas v. Peterson*, 753 F.2d 754, 763 (9th Cir. 1985); 50 C.F.R. § 402.14(a)). Formal consultation is excused only where (1) an agency determines that its action is unlikely to adversely affect the protected species or habitat, and (2) the relevant Service (USFWS) concurs with that determination. *Id.* (citing 50 C.F.R. § 402.14(b); *Pacific Rivers Council v. Thomas*, 30 F.3d 1050, 1054, n.8 (9th Cir. 1994)).

Consultation under the Endangered Species Act is conducted both formally and informally. Formal consultation occurs when adverse effects to species cannot be mitigated, including when a “take” authorization is required for project implementation. In instances where adverse effects will occur, the action agency officially requests formal consultation and USFWS prepares a Biological Opinion (BO) with the take permit.

Informal consultation occurs prior to a request for formal consultation. Informal consultation is the process where design features and mitigations are explored to reduce impacts to listed species. If impacts cannot be mitigated, formal consultation (BO) is requested. If impacts can be reduced and adverse effects are unlikely to occur, informal consultation can be concluded with a Letter of Concurrence from USFWS. In order to achieve the “not likely to adversely affect” determination on a project, mitigations are imposed to ensure no adverse effects would occur.

The Forest conducted informal consultation on the Somes Bar Integrated Fuel Management Project with the USFWS, which does not mean that the review was any less thorough or intensive. In order to achieve the “not likely to adversely affect” determination on the project, many mitigations were imposed to ensure no adverse effects would occur. The Forest Service has worked extensively with the USFWS to ensure that projects such as the Somes Bar Integrated Fuel Management Project are designed to protect listed species and their Critical Habitat.

The informal consultation process on the Six Rivers National Forest is conducted under the Level 1 Consultation process. The Level 1 process requires biologists from the US Forest Service and the USFWS to work together to identify potential impacts to listed species and, where possible, to propose mitigation measures that will minimize impacts to those species (See Table 3).

Table 3: Federally listed wildlife species analyzed for the Somes Bar Integrated Fire Management Project

Species	Status	Determination of effect (all action alternatives)
Northern spotted owl (NSO)	Federally threatened	May affect, not likely to adversely affect.
2012 NSO Critical Habitat		May affect, not likely to adversely affect.

Informal consultation on the Somes Bar Integrated Fire Project was initiated on April 7th, 2015. This meeting was held with USFS Staff, and Biologists from both agencies. This meeting set the stage for project design and development and since this initial Level 1 meeting nine subsequent

meetings including field visits have occurred during the development of this project. (See Table 4 below for Dates, Attendees and Location).

Table 4: Level 1 meetings between US Fish and Wildlife Service and U. S. Forest Service with dates, attendees and location.

Date	Attendees	Location
7-Apr-15	John Hunter (FWS); Carolyn Cook, Kary Schlick, Bryson Code, Corrine Black, Brenda Devlin, Karen Kenfield, Lisa Hoover (FS)	Six Rivers NF
28-Apr-16	John Hunter (FWS); Brenda Devlin, Corrine Black, and Jamie Bettaso (FS)	Field Visit WKRP
29-Jun-16	Brenda Devlin (FS) and John Hunter (FWS)	Field Visit WKRP
14-Jul-16	Leif Hillman, Bill Tripp (Karuk Tribe), Will Harling (MKWC), John Hunter (USFWS), Jen Dyer, Corrine Black, James Bettaso, Cassandra Marszal, Krista Smith, Andrew Spain, Zach Taylor, Roberto Beltran, Brenda Devlin (USFS)	Field Visit Donahue Flats
8-Dec-16	Nolan Colegrove, Corrine Black, Brenda Devlin, Cassandra Marszal, Jamie Bettaso (FS), John Hunter (USFWS), and Jill Beckman (Karuk Tribe- present for morning mapping discussion).	Orleans RD Six Rivers NF
22-Feb-17	John Hunter and Katie Siedel (USWFS), Bryan Yost, Corrine Black and Jamie Bettaso (SRNF)	Arcata FWO
5-Apr-17	John Hunter and Katie Siedel (USFWS), Bryan Yost, Krista Smith, Cassandra Marszal and Jamie Bettaso (SRNF)	Six Rivers NF
3-Aug-17	Cancelled due to fires	
7-Sep-17	John Hunter (USWFS), Katie Siedel (USFWS), Bryan Yost, Carolyn Cook, Krista Smith, Cassandra Marszal (VTC), Jamie Bettaso, Katie Rivette, and Mark Reynolds (SRNF).	Six Rivers NF
13-Dec-17	John Hunter (USWFS), Katie Siedel (USFWS), Bryan Yost, Brenda Devlin, Carolyn Cook, Krista Smith, Jamie Bettaso, Kenny Sauve (Karuk Tribe), and Corrine Black.	Six Rivers NF
7-Feb-18	John Hunter and Katie Siedel (USFWS), Bryan Yost, Jamie Bettaso, Krista Smith, and Corrine Black (USFS)	Six Rivers NF
9-Mar-18	John Hunter (USFWS), Bryan Yost, Corrine Black, Jamie Bettaso (USFS) and Kenny Sauve (Karuk Tribe)	Six Rivers NF

After discussion of northern spotted owl activity centers occurrence records in the project area and proposed treatment units, the Level 1 Team developed the following criteria:

- NSO nest groves - No commercial treatments in any nest groves. The two known nest groves within the Project Area are Ti Bar AC1250 and Donahue AC53.
- NSO habitat treatments: Maintain an average overstory canopy cover of 60 percent in treatment units mapped as nesting/ roosting habitat, and will maintain an average overstory canopy cover of 40 percent in treatment units mapped as dispersal and foraging habitat.
- During project design with the Level 1 team and the USFWS, it was determined that four NSO ACs (1250, 1073, 58 and 53) cores (0 to 0.5 mile) were deficit in habitat. The following commercial units in the deficit cores (Table 5) would receive an 18-inch-dbh limit. These units would maintain post-treatment average overstory canopy cover of 60 percent in treatment units mapped as nesting/roosting habitat and would maintain an average overstory canopy cover of 40 percent in treatment units mapped as foraging or dispersal habitat.

Table 5: Units with 18-inch-dbh cutting limit.

Project Area	Unit	NSO Activity Center Number	Treatment Method
Donahue	2421	58	Mechanical
Donahue	2456	58	Mechanical
Donahue	2474	53	Mechanical
Donahue	2480	53	Mechanical
Ti Bar	2105	1250	Mechanical
Ti Bar	2110	1250	Mechanical
Patterson	2225	1073	Mechanical
Patterson	2227	1073	Mechanical

- All 111 acres of unoccupied high-quality nesting/roosting (HQNR) habitat as mapped within the project area would receive a manual fuels treatments. The proposed treatment for high-quality nesting/roosting habitat would be cutting, piling, burning material ≤ 4 inches, and/or a low-intensity underburn. A high-quality nesting/roosting habitat polygon may occur in more than one unit (Table 6) and only the portion of high-quality nesting/roosting habitat within the unit will be treated with this prescription.

Table 6: High-quality nesting/roosting habitat polygons that overlap treatment polygons.

Treatment Type	Unit #	Project Area	Treatment Type	Unit	Project Area
Manual Prescribed Burn	2100	Ti-Bar	Manual Prescribed Burn	2103	Ti-Bar
Manual Prescribed Burn	2121	Ti-Bar	Manual Prescribed Burn	2122	Ti-Bar
Manual Prescribed Burn	2149	Ti-Bar	Manual Prescribed Burn	2153	Ti-Bar
Manual Prescribed Burn	2161	Ti-Bar	Manual Prescribed Burn	2162	Ti-Bar
Manual Prescribed Burn	2169	Ti-Bar	Manual Prescribed Burn	2250	Patterson
Manual Prescribed Burn	2252	Patterson	Manual Prescribed Burn	2288	Patterson

Treatment Type	Unit #	Project Area	Treatment Type	Unit	Project Area
Manual Prescribed Burn	2291	Patterson	Manual Prescribed Burn	2410	Donahue
Manual Prescribed Burn	2424	Donahue	Manual Prescribed Burn	2430	Donahue
Manual Prescribed Burn	2432	Donahue	Manual Prescribed Burn	2440	Donahue
Manual Prescribed Burn	2455	Donahue	Manual Prescribed Burn	2509	Donahue
Mechanical Ground-Based/ Manual Prescribed Burn	2119	Ti-Bar	Mechanical Ground-Based/ Manual Prescribed Burn	2225	Patterson
Mechanical Ground-Based/ Manual Prescribed Burn	2249	Patterson	Mechanical Ground-Based/ Manual Prescribed Burn	2493	Donahue
Mechanical Road-Based/ Manual Prescribed Burn	2120	Ti-Bar	Prescribed Burn	2144	Ti-Bar
Prescribed Burn	2443	Donahue			

IV. Assumptions and Methods for This Analysis

Assumptions

The following assumptions were made for this Biological Assessment in order to establish a baseline of information from which an analysis of effects can be made. The following list is an attempt to capture areas where knowledge gaps or uncertainty existed but where assumptions were needed in order to facilitate an effective analysis. The assumptions below are not a complete listing of all assumptions that must be made for any effects analysis, but is a description of the uncertainty in certain aspects of the species' biology, in the habitat and/or species location data, as well as where an increased potential exists for differing interpretations of the project design.

- The NSO habitat layer, derived from the EVEG 2007 remotely sensed data, provides a generally accurate depiction of NSO habitat at the scale at which it was used for this analysis; however, variations exist across the landscape, where habitat will be under-typed in some areas and over-typed in others, but that generally the habitat is depicted accurately. The majority of the uncertainty in the habitat typing within the layer stems from the category assigned to the habitat i.e. 'nesting/roosting' or 'foraging', but the designation as "suitable" is generally correct.
- Geographical Information Systems (GIS) has been extensively utilized in the Somes Bar Integrated Fire Management Project for analysis of proposed actions on multiple disciplines from wildlife and fisheries to culturally significant sites to map stand types and prescription layouts. Integration of multiple layers carries the caveat of how layers were obtained, e.g. EVEG 2007 is the existing vegetation types derived from the USFS remote sensing laboratory compared to layout design based on field visits and aerial photography interpretation. When a combination of layers for habitat types with proposed actions over a 5570 acre project, many iterations are from marginal overlaps of two layers being clip out into a unique polygon that often will be less than one acre. For purposes of our reporting, generally whole acres are reported for prescriptions that are manual, mechanized or prescribed burn units, whereas for roads and landings, that often involve less than an acre in spatial scale (e.g. .25-0.75 acre landings), these are reported to the single decimal.

At the road and landing scale canopy loss would be minimal and may not be more than the thinning surrounding the road. Removal of habitat for landings and roads is limited to small areas and is considered insignificant because after treatment they will be decommissioned and will resemble small forest openings. Small openings can be beneficial in stands lacking

structural diversity to “maximize individual tree development, encourage some understory vegetation development, and encourage the initiation of structural diversity” (Interagency Regional Ecosystem Office memorandum 1996). Often the canopy above the roads still falls within the 40% retention thresholds but is being considered removed to evaluate the full potential of affects to any given activity center.

- RAVG data are an accurate depiction of burn severities. To account for NSO habitat changes and the change of existing condition from the 2017 wildfires (Marble, Ukonom and Haypress fires) we used RAVG to adjust the habitat baseline within the NSO action area. This accounts for recent fire effects to NSO habitat.
- Habitat loss due to fire-fighting suppression activities. Post-fire suppression action information acquired for the 2017 wildfires (Marble, Ukonom and Haypress fires) was accurate and accounted for all habitat removal, downgrade or degrade of suitable NSO habitat. To account for NSO habitat changes during 2017 wildfires we evaluated the effects of the suppression actions on NSO habitat within the NSO action area. During this evaluation process we used the interagency ftp site (ftp.nifc), communicated with READs and fire personnel on the 2017 fires and adjusted the NSO habitat baseline post-suppression actions within the Somes Bar Integrated Fuel Management Project NSO action area. This habitat baseline adjustment which included both RAVG and suppression actions created a “new existing condition” and this adjusted baseline was the foundation from which we conducted the NSO habitat analysis for the Project.
- NSO home ranges and core areas represent the best placement of an activity center that we can make given the recent surveys conducted within the project area. Uncertainty inherent in using simple circles to represent owl use patterns at the home range and core area scale.

Methods and Definitions

Project Area: A defined area that encompasses all the treatment units using logical, on-the-ground boundaries. The project area has been divided into four Focal Areas (Ti-Bar, Patterson, Rogers Creek and Donahue).

Treatment Units: A subset of the Focal Areas where proposed thinning units, fuels treatments, underburning, strategic fuel breaks, and hazard trees would be felled or removed; and includes only the areas that would be directly impacted by the proposed actions.

Action Area: The action area includes a 1.3 mile buffer from proposed treatment units in addition to any NSO home range that intersects the project area boundaries (Ti-Bar, Patterson, Rogers Creek or Donahue focal areas), in order to account for any NSO ACs that may be directly or indirectly affected by the project activities. The Action Area for this project is 46,243 acres (See Figure 2 for Action Area, pg. 34). The Action Area contains 8,047 acres of dispersal habitat, 12,615 acres of foraging habitat, and 15,369 acres of N/R habitat.

High-Quality Nest/Roost Habitat: Older, multi-layered structurally complex forests that are characterized as having large diameter trees, high amounts of canopy cover, and decadence components such as broken-topped live trees, mistletoe, cavities, large snags, and fallen trees. This is a subset of spotted owl habitat and specific characteristics may vary due to climatic gradients and abiotic factors across the range.

Temporal Bounding: Temporal bounding for this analysis is both short term and long term. The short term bounding is the time of project implementation because it is tied directly to the potential for noise disturbance and because this would be the source of the potential impacts to all affected species by way of possible disturbance if present. The vast majority of the commercial harvest would be done in the first three-five years, though hazard tree removal, and fuels treatment activities may continue for multiple years as funding allows. The long-term (≤ 15 years) will include the time when the fuels treatment units will be implemented.

AC: The activity center (AC) is the point within the core (0-0.5 mile) centered on most biologically relevant point. The AC is placed within the core (in order of relevance) an NSO nest, pair daytime sighting, or single daytime detection.

Core area: The area within a 0.5 mile circle (~503 acres).

Home range: The area from the center point (AC) of the core area to a 1.3 mile radius circle (~3398 acres), which includes the acres within the core area.

NRF: Nesting/Roosting and Foraging habitat – as defined in more detail below.

RAVG: RAVG data are derived from Landsat Thematic Mapper imagery. The pre-fire and post-fire subscenes were used to create a Relative Differenced Normalized Burn Ratio (RdNBR). The RdNBR is correlated to the variation of burn severity within a fire. The RdNBR data are calibrated with the Composite Burn Index (CBI) as well as tree mortality variables. See the USGS National Burn Severity Mapping web site at: http://burnseverity.cr.usgs.gov/fire_main.asp for generic information on fire severity mapping procedures. The severity ratings provided by the derived products are based on the severity to vegetation. RVAG grid code severity ratings for changes in basal area was converted to a vector format and joined with the NSO EVEG habitat layer (pre-wildfire) for each fire perimeter.

NSO Habitat Typing

NSO habitat was split into three categories: nesting/roosting, foraging, and dispersal.

Nesting/roosting is generally described as mid- to late-seral forests that contain stands of large trees with high canopy cover, multilayered canopies, and nesting platforms. Foraging habitat can be described as slightly reduced canopy cover, less large trees, and enough space for NSO to maneuver through trees for hunting prey when compared to nesting/roosting habitat. Dispersal habitat contains a moderate level of canopy closure and trees large enough to provide shelter and areas for potential foraging opportunities for traveling NSO. In addition to these biotic features, abiotic features such as slope position and distance to water were also used to determine habitat type.

NSO habitat condition was initially assessed using Remote Sensing Lab data (EVEG2007) in combination with the Orleans Ranger District vegetation GIS layers. The project area also had LIDAR and a canopy height model to assess stand conditions. All of these tools were used in combination with on the ground assessments and ortho imagery interpreted by the District

Biologist. The habitat type that was determined using the GIS data was validated with on-the-ground sampling that included areas representing NSO habitat and non-habitat.

NSO Analysis Process

The Northern spotted owl analysis was split into multiple relevant spatial scales to estimate direct and indirect effects to NSO habitat: 1) Critical habitat sub unit (landscape scale), 2) Action Area (watershed scale), and 3) home range (individual scale). The habitat analysis will estimate the number of acres of habitat affected by the proposed activities within the Action area. The home range analysis will estimate the effect of the proposed treatment on habitat within the NSO core and home range and resulting effects to NSO. The critical habitat analysis estimated the effects to habitat function within critical habitat that may occur as a result of the proposed activities.

The resulting level of effects to the habitat was determined to be either no effect, maintained, downgraded, or removed. No effect means that the action will not measurably decrease the quality of habitat. **Maintain** means the effects are minimal and the habitat remains functional post-treatment. **Downgrade** means the habitat has been affected to the point where the habitat will not continue to function at its initial habitat type and it will drop down one level in habitat type. **Removal** means the habitat prior to treatment will no longer function as NSO habitat. Qualitative and quantitative attributes were considered in this process including the anticipated change in habitat structure after treatment. Not only were FVS modeling predictions used but effects to habitat considered size of parcel treated, homogeneity of the stand conditions pre and post treatment, habitat conditions that were adjacent to the areas treated, position on slope and aspect of parcel treated, distribution of untreated riparian areas, and the distribution of RA-32 leave areas retained. The culmination of these factors all weighed in the determination of modified, downgrade, or removal of habitat conditions predicated after treatment.

The USFWS has determined minimum habitat guidelines, or the minimum amount of nesting/roosting (N/R) and foraging (F) habitat, that must be maintained in a territory within a specific distance from the core area of use in order for an NSO pair to persist at the site. Further habitat removal below this minimum may be considered “take” under the Endangered Species Act (ESA). These habitat guidelines are also used to assess the relative condition of the core area and home range). The Klamath and Six Rivers both use the relative condition of the core area and home range to evaluate the level of impact from habitat treatments (manipulating the habitat but maintaining habitat function) even though no take will occur.

In 2009, the USFWS determined that the “accumulation of published research results, combined with direct field experience with management of NSO and their habitat, resulted in substantial changes in the quantity and quality of habitat the USFWS considered necessary to maintain continued occupancy and reproduction at NSO territories.” The USFWS prepared the 2009 white paper because “the large number of recently published studies requires that a full synthesis of current knowledge be conducted and incorporated into updated take evaluation guidelines.” The

white paper represents the synthesis of the best available science in the development of the habitat retention guidelines.

The USFWS recognized that “habitat retention guidelines must incorporate the range of habitat conditions used by NSO for nesting, roosting, and foraging, while at the same time ensuring that habitat conditions are not modified to the point where significant impairment of breeding, feeding, and sheltering occurs. The USFWS guidelines achieve this balance and provide a robust method for evaluating the likelihood of take because they describe a range of habitat conditions representing the central tendency for high-quality nesting habitat, nesting/roosting habitat, foraging habitat, and low-quality foraging habitat that may provide prey resources”.

The USFWS has updated the guidelines to be used in evaluating take. These guidelines represent the preponderance of evidence derived from careful evaluation of the results and conclusions of many published studies. The USFWS guidelines provide the scientific and biological foundation for the determining the likelihood of incidental take. The 2009 white paper provides the scientific basis for the USFWS guidelines.

The Six Rivers Land and Resource Management Plan (LRMP USDA 1995) describes the analysis area for “take” at 0.7 mile from the center of use. The white paper presents evidence and a recommendation to modify the analysis area (or core area) for NSO take guidelines from 0.7 mi to 0.5 mi. This recommendation is based on the literature describing core areas of use and predictability of occupancy (Zabel et al. 2003, Bingham and Noon 1997). The white paper also provided evidence to change the proportions and types of habitat to be maintained within the core area. Evidence presented in the white paper indicated that the highest use areas were within 0.5 mi of the nest and contained a combination of nesting/roosting and foraging habitat. The white paper found that the relationship of N/R to F is important in predicting NSO presence.

The evidence presented in the white paper strongly supports the use of 0.5 mi core analysis area for the Six Rivers. The Bingham and Noon (1997) study tracked NSO with radio telemetry on the Six Rivers (Mad River), as well as the Klamath (Ukonom) and Lassen National Forests. The results indicated that the majority of use occurred within 0.5 mi. Other studies also suggest that 0.5 miles is a biologically meaningful scale to conduct a habitat analysis. The model developed by Zabel et al (2003) used NSO data from all four Northern California forests, including the Six Rivers. They found that the model best predicted NSO presence at the 200 ha or 0.5 mi scale, and that the highest likelihood of presence depended on the proportion of N/R to F within 0.5 mi.

Evidence from all the studies combined (including data from the Six Rivers) found that the mean proportion of at least 50% of the 0.5 mi should consist of older forests. The white paper states “The averages for all combinations of habitat associated with a high probability (≥ 0.70) of occupancy were 48 percent nesting-roosting and 28 percent foraging habitat.” Applying these percentages rounded up to the 0.5 mi scale results in the guidelines described in the white paper: 250 acres should be older forests (nesting and roosting) and 150 acres should be in intermediate forests (foraging habitat).

Although the minimum habitat guidelines are the same for both private and federal lands, the white paper was written specially for use on private lands in the Klamath interior region. Private companies are only responsible for avoiding unauthorized “take” under the Endangered Species Act (ESA). The Forest Service is not only responsible for avoiding “take” but also for using its authority to conserve the species, including recovery of the species under section 7(A)1 of the ESA

. Therefore, in recognition of the broader ranging Federal responsibilities towards the owl, the L1 Team believed that the following additional criteria for the entire home range should be added to those found in the white paper as well as changes to definitions of to reflect regional differences.

The guideline for the home range is to maintain 1336 acres of N/R and F within 1.3 miles, 400 acres within 0.5 mi and 936 between 0.5 and 1.3 miles of the activity center. Because the white paper was written for use on private lands, it allowed the 936 acres to consist of foraging-only habitat. While this configuration is likely to prevent take under ESA, the L1 Team believed it was not likely to aid in the recovery of the species. In an effort to address the Forest's 7(A) (1) responsibilities, the L1 Team proposes that 936 acres consist of a minimum of 300 acres N/R and 636 acres foraging. The 0.5 mile is the core for nesting and the outer area, out to 1.3 mile, provides other elements critical to their life histories such as foraging. It is also important to recognize the difference between the uses of habitat recommendations in the determination of take under ESA versus descriptions of desired habitat conditions for conservation of NSO.

The proportion of N/R to F in the 936 acres is extremely important. Some recent studies have shown the need for higher levels of foraging in the outer ring than nesting (Williams 2008). A ratio or proportion of N/R to F is not given; however, Williams found that as N/R increased past a point, the suitability of an area decreased.

Williams (2008) found that for foraging, mature forests (old growth and late mature) with 40–70% overstory canopy cover had a high relative probability of selection in patches <25 acres (in other words foraging occurs in NR as well as foraging-only stands), however, as patch sizes increased in this type and overall area covered by this type increases, use for foraging decreases accordingly. Mature forests with >70% canopy cover (high quality nesting habitat; HQN) did not have a high relative probability of selection by owls for foraging. Owls using this class foraged more closely to transition areas than random points. It has been noted that spotted owls frequently forage in transitional edges (Bent 1938, Zabel et al. 1995, Sakai and Noon 1997, Ward et al. 1998). A transition area is one forested type to another and not 'edge.' Clearcut to forest is considered "edge", whereas a forest type to a different forest type is transition, due to age or species composition.

Williams (2008) also noted that spotted owls in his study area selected home ranges that contained a higher proportion of old-growth and mature forests relative to its availability in the core area. However, when habitat use was analyzed at the foraging scale, these vegetation classes did not have as high a probability of selection. Owls may not require these vegetation classes for foraging, but because sites selected for foraging are located in close proximity to areas having higher proportions of mature forests (nesting/roosting) relative to their availability, mature forests may provide habitat characteristics that satisfy requirements other than foraging. Provided nesting habitat requirements are met, owls are able to select areas within their home range that provide the best hunting opportunity (i.e., areas with high prey abundance and physical characteristics conducive to owl hunting maneuverability). Younger conifer forests provide such opportunities. These younger stands are more desirable to the owls if they are associated with mature forest areas that offer protection from storms and predation in the terms of roosting. Nesting/roosting stands may also be used as the platform from which to hunt the larger patches of younger forest. This would support the idea that small patches of mature forest within and adjacent to younger stands

are selected more for foraging than large patches of mature forest. Williams (2008) hypothesized that as an area progresses towards older trees, higher quality owl prey locations are lost.

Although Williams found that as overall area within a home range covered by mature forest increases use for foraging decreases accordingly, Franklin (2000) found that an area devoid of mature forests typically will not even support foraging for spotted owls. There is also some indication that more homogenous landscapes of either young or mature stands benefit the expansion of the barred owl with its generalist prey characteristics (Livezey 2007) where as a more diverse mosaic benefits the development of rodents and therefore the spotted owl.

As discussed above, research indicates that a proportion of the outer ring needs to be comprised of mature forest as well as younger stands. However, there is no information on what the ratio should be. The Level 1 Team proposes a ratio of a 1/3 NR to 2/3 F for the 936 acres, or 300 acres NR and 636 acres F as a minimum guideline for calculating 'take' in the 936 acres of the outer ring. At a minimum it affords greater protection and support to the owls than the current white paper requirement of 936 acres of foraging only.

Based on the above information as well the results of an analyses conducted on habitat use by known NSO pairs on the Six Rivers, the Level 1 team has agreed that the Forest will use the 0.5 mi analysis area with the 250 acre nesting/roosting to 150 acre F ratio. In addition the Klamath National Forest uses the 0.5 mile analysis area with the 250 acre nesting/roosting to 150 acre F ratio. The Forests will use a modified ratio within the outer ring of the territory of 300 acres NR and 636 acres F (total 936).

Although the Six Rivers Land and Resource Management Plan (LRMP) requires an analysis at the 0.7 mile scale, it is only required for formal consultations involving adverse effects to nesting/roosting habitat. In those instances, an analysis will be conducted at the 0.7 mi to be consistent with the LRMP as well as the more biologically meaningful 0.5 mi scale. The project will treat and maintain suitable NSO habitat with the exception of new temporary roads and landings. See details of new temporary roads and landings below. The Level 1 Team determined that the Somes Bar Integrated Fuel Management project was not likely to cause adverse effects and therefore will only require analysis at the 0.5 mile, 1.3 mile, and action area scales.

V. DESCRIPTION OF PROPOSED ACTION

Introduction

Western Klamath Restoration Partnership (WKRP)¹ representatives prepared the Somes Bar Integrated Fire Management Project Draft Environmental Assessment (EA), per the National Environmental Policy Act of 1969 (NEPA), to disclose the effects of a demonstration proposal that once again welcomes fire on public lands. This project is just the first phase in realizing the goals of

¹ ***Western Klamath Restoration Partnership (WKRP):*** WKRP formed in 2013 to build trust and a shared vision for restoring fire resilience at the landscape scale. Members include representatives from the US Forest Service, Karuk Tribe, Mid Klamath Watershed Council, Orleans-Somes Bar Fire Safe Council, Salmon River Restoration Council, The Nature Conservancy Fire Learning Network, Klamath Forest Alliance, Environmental Protection Information Center, University of California Berkeley, Bureau of Indian Affairs, National Oceanic and Atmospheric Administration, Environmental Protection Agency, and US Fish and Wildlife Service.

the National Cohesive Wildland Fire Management Strategy² (Cohesive Strategy), in accordance with traditional ecological knowledge (TEK)³ and customs, as a framework for living with fire in the western Klamath Mountains of northern California.

The Somes Bar Integrated Fire Management Project (Somes Bar Project) exemplifies participatory planning where all contributors share responsibilities for each other's safety and well-being, and for preserving the nation's natural resources and our cultural legacy for future generations (Harling and Tripp 2014). With this vision in mind, dedicated collaborators convened workshops and field trips, coming to agreement in principle and practice on a wide range of stewardship treatments across the landscape to begin healing the land.

All proposed treatments are designed to reduce and breakup fuel continuity, while maintaining sufficient tree shading, benefiting forest health and resiliency. The Proposed Action involves thinning of intermingled densely growing ladder and crown fuels, hand cutting, chipping, mastication, machine- and hand- piling debris, manually lopping and scattering surface and small ladder fuels, prescribed jackpot burning, culturing around trees of cultural interest, and underburning.

Western Klamath Restoration Partnership

Through outreach and involvement of local, state, tribal and federal entities, the Western Klamath Fire Learning Network (WKFLN) was formed to address the need for increased education and communication around fire and fire management. Momentum grew to surrounding communities after the first meeting in May 2013, and stakeholder groups from the Salmon River attended the July 2013 meeting. Based on their participation and interest, the partnership settled on a planning scope that included the entire Salmon River watershed. The name of the group changed to the Western Klamath Restoration Partnership (WKRP) to reflect this increase in geographic scope.

“Establish and maintain resilient ecosystems, communities, and economies guided by cultural and contemporary knowledge through a truly collaborative process that effectuates the revitalization of continual human relationships with our dynamic landscape.” –WKRP Vision

² **National Cohesive Wildland Fire Management Strategy (Cohesive Strategy):** The Federal Land Assistance, Management and Enhancement Act of 2009 (FLAME Act) was signed by the President in November 2009. The Act states, in part, “Not later than one year after the date of the enactment, the Secretary of the Interior and Secretary of Agriculture shall submit to Congress a report that contains a cohesive wildfire management strategy.” The Act directs that a cohesive strategy be developed addressing seven specific topic areas ranging from how to allocate fire budgets at the Federal level to assessing threats to communities, and prioritizing hazardous fuels project funds. The Act is the catalyst for bringing fire leadership at all levels and agencies together and prompting a new approach to how wildland fire is managed (www.forestsandrangelands.gov).

³ **Traditional Ecological Knowledge (TEK):** cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment (Berkes et al. 2000).

Project Description

Objectives of Proposed Treatments and Background

This project was designed as a restoration-based project that would promote the development of late-successional habitat, retain existing pre-dominant and dominate trees, and reduce the risk of large, high severity wildfires. Implementation of the proposed actions would move the project area toward more ecologically resilient conditions.

Alternative 2 was developed based on public comment in response to scoping and on resource specialist review and input. It proposes a variety of treatments on approximately 5,570 acres. Treatments proposed are outlined in Table 7.

In order to prepare the land for restorative fire once again, strategically placed manual, mechanical and smaller prescribed burning treatments would be implemented on and around private inholdings, along critical fuelbreaks and access routes, and sensitive cultural/archaeological/natural sites. Once these treatments are in place, carefully planned prescribed burns in the early fall starting from our established fuelbreaks downslope will accomplish the bulk of the proposed fuel reduction actions.

Lastly the Forest Service is directed to conduct habitat restoration and to enhance stand resistance from stand-replacing wildfire by the National Cohesive Wildland Fire Management Strategy (Cohesive Strategy), the Northwest Forest Plan as incorporated into the KNF Land and Resources Management Plan (LRMP), and the SRNF LRMP. The following summarizes the background and general project objectives:

- This project has a multi-faceted approach focused on the ecological restoration through combinations of commercial thinning, non-commercial thinning, strategically placed fuel breaks, jackpot burning and prescribed underburning.
- To some degree proposed treatments are expected to mimic natural disturbance by retaining the large tree component (pre-dominate and dominate), reducing forest stand density of co-dominate and smaller trees and reducing existing fuel loads in variable, mosaic-like patterns at the stand and landscape level.
- The need for action in the project area primarily results from changes in fire regimes over the last century. Fire suppression over the last century, combined with past vegetation management in the Somes Bar Integrated Fire Management Project area, has resulted in a landscape dominated by denser, young and mid-successional forests that are lacking structural diversity.
- The Project area is located in an area of high concentration of lightning strikes. Without the influence of fire to create and maintain stand diversity, many of the stands within the project area are unlikely to develop into functional late-successional habitat due to factors associated with inner-tree competition and lower resilience to mixed-severity fires.
- The use of prescribed “controlled” fire is proposed to meet two objectives: (1) returning the ecological role of fire into a landscape historically adapted to this type of disturbance, and (2) spatially locating these burn units in areas that will result a landscape that, if and when

natural fires occur, would be more resilient to the effects of mixed severity fires. Prescribed fire will mimic low-intensity wildfires and will decrease surface and ladder fuels.

- Combined, these efforts would contribute to protecting the larger blocks of late-successional habitat and increasing the landscape's resilience to severe wildfires, and return fire to the ecological system.
- Fuel treatments would occur in riparian reserves that need this treatment. Within the riparian reserves, actions are designed to minimize ground disturbance and maintain canopy cover while reducing the risk of a higher intensity wildfire. Implementation of the project would improve riparian habitat conditions.

Proposed Action and Implementation Strategy

The WKRP IDT designed a series of phased entry, integrated fuels reduction and ecological restoration land management treatments for 15 years, to the degree suppression would no longer be the primary choice for fire managers in the near future. Table 7 below summarizes the phasing and order of treatments intended to prepare the landscape for prescribed burning, achieving the desired fire effects intended to meet the purpose and need for the project. The sequencing is designed to ensure safe and efficient application, while minimizing undesirable effects to natural and TEK resources. Appendix B provides a complete list of proposed prescriptions for the Somes Bar Integrated Fire Management Project. Appendix B also provides detailed information for the prescription ID column in table 7.

Table 7. Proposed Action and Phasing of Treatments.

Proposed Treatment	Prescription ID	Acres
First Entry		
Plantations – Commercial/Mechanical thinning and removal of fuels, handpile and handpile burn.	1a and 1b	660
Non-Plantations – Commercial/Cultural tree species restoration and ladder-fuel mechanical thinning.	2	573
Plantations – Commercial/Ladder-fuel mastication.	3	187
Plantation – Ladder-fuel manual thinning.	4a	502
Non-Plantation – Ladder-fuel manual thinning.	4b	2,156
Plantation and Non-Plantation – Ladder-fuel prescribed fire.	5a	1,491
Total		5,570
Second Entry		
Manual Thinning Ladder Fuel Post Mechanical and Post Mastication Entries.	4c	1,420
Third Entry (provided associated handlines and control features are in place)		
Prescribed Fire – Understory and jackpot burn in all mechanical units, where needed	5a	1,233
Prescribed Fire – Understory and jackpot burn in all manual units, where needed.	5b	2,658
Prescribed Fire – Understory and jackpot burn in all mastication units, where needed.	5c	187
Total		4,078
Maintenance Entry		
Prescribed fire in mechanical and manual treated units.		5,570

Connected Actions

The *Somes Bar Integrated Fire Management Project* would establish up to 250,822 linear feet of Strategic Fire Control Features (SFCF) and implement up to ~5,570-acre landscape-scale integrated vegetative, fuels reduction and restorative prescribed burning alongside roads and interior forests, phased over 15 years. A maximum of 160 landings (30 would be newly constructed), long-term and incidental temporary hand lines, and 11 miles of temporary road access (0.6 miles of new construction) may be required to facilitate operations, as summarized in Table 8. The connected actions in Table 8 are not additive acreage to the treatments in Table 7.

Table 8. Proposed connected actions treatment summary (See project descriptions below)

Integrated Fire Management Treatments		Area and/or Length
Strategic Fire Control Features		Feet / Acres
Ridgetop Shaded Fuel Break		105,524 ft / 229.8 ac
Handlines		145,298 ft / 17.2 ac
Landings – Mechanical and Mastication units only	Number	Acres
Existing Landing	130	63
New Landing	30	13
Total	160	76
Temporary Use Road – Access to Mechanical and Mastication units		Miles
Existing Mastication Access Road		2.3
Existing Temp Roads		8.1
New Temp Road		0.6/.3 acres NRF
Total		11.0
Level 1 Roads to be Used – Provides access to Mechanical, Manual and Prescribed fire units		Miles
13N12A		0.9
13N14A		1.2
13N14C		0.2
13N14D		0.5
13N14E		0.5
13N18A		0.3
13N18E		0.5
14N15		0.5
Total		4.7
Legacy Road Sediment Source Restoration – Route Number		Miles
9400		0.09
9100		0.35
9101		0.13
9102		0.22
9103		0.19

Integrated Fire Management Treatments	Area and/or Length
9402	0.11
<i>Total</i>	<i>1.09</i>

Description of Proposed Treatments

Commercial/Mechanical Treatments

Commercial/Mechanical Treatments –Three types of mechanical/commercial treatments are proposed for the project Plantation Ladder fuel mastication (187 acres), mechanical thinning in plantations (660 acres) and mechanical thinning in non-plantations (573 acres). The mechanical/commercial acres proposed for treatment total 1,420 acres. The proposed treatments would include 187 acres mastication, 103 acres mechanical cable, 1,057 mechanical ground based, and 73 acres mechanical road based treatments. Similar actions as described for the manual treatments but in stands where there are opportunities for restoration by-products (firewood, saw logs). Ground, cable and road based heavy equipment (yarder, tractors) are utilized to remove excessive fuel build up in plantations over 40 years of age and older, more mature stand. In plantations, residual canopy closure would be maintained at or above 40%. Important cultural and ecological plant species would be targeted for enhancement wherever possible. For example, older stands where larger black and white oak or sugar pine are being encroached by other less fire tolerant conifer species, efforts would be aimed at culturing around these more fire tolerant species to promote their health and vigor and to help ensure these species continue to thrive in the project area. This will also aid in our efforts to provide meaningful forest industry jobs. Activity fuels may also be handpiled and burned.

Commercial Plantation Ladder Fuel Mastication

Approximately 187 acres (see table 7 & Appendix B, Prescription ID 3) within 16 units are proposed for mastication treatment. The objective is to break up some of the continuous fuel bed in young Douglas-fir plantations in preparation for prescribed burning. Utilizing former skid and logging roads, masticators work on reducing fuel loading on and adjacent to these linear features. In essence, they create a path through dense plantations from which crews can conduct additional manual fuel reduction treatments and planned burning operations. Masticate small-diameter vegetation, generally less than 4- to 6-inch dbh, across 60 percent of the treatment area to minimize the amount of slash material on the ground. Some of these areas would have a follow up manual treatment.

Silvicultural Treatments (Skip & Gap Treatments) Plantation and Non-Plantation Thinning

All thinning within plantation and non-plantations stands will deliberately vary spacing between trees (variable density thinning) to create more structurally diverse stands. To develop future horizontal and vertical diversity characteristic of late-successional forests capable of supporting owls, the variable density thinning regime would create patches of untreated (skips) and treated areas (gaps) in addition to thinning between the “skips and gaps” to increase stand structural and species heterogeneity.

Commercial Thinning in Plantations

Approximately 660 acres (See table 7, Prescription ID 1a and 1b) of plantation thinning would occur with the proposed action. Plantations proposed for treatment were planted to Douglas-fir and/or Ponderosa pine from approximately 1960-early 1990s. The plantations are dense, even-aged, single-story, and consist primarily of commercial trees ≥ 10 inches DBH, but some plantations contain a mix of commercial and non-commercial trees. Thinning would aim to increase growth and vigor of healthy trees, increase structural diversity and break up fuel continuity within these young stands.

Commercial Thinning in Non-Plantations

Approximately 573 acres (See table 7 Prescription ID 2) of non-plantation thinning would occur with the proposed action. Over the last century, substantial changes have taken place in the stands due to the exclusion of wildfires. These stands have developed dense understories and mid-stories and are much more heavily stocked and homogeneous than historic conditions. Thinning would reduce competition between trees, thereby reducing stress on large old trees, increasing growth and vigor of mid-successional trees, and reducing or removing “ladder fuels” beneath and around residual large conifer and hardwood trees. Thinning would retain trees of all size classes retaining stands that are uneven-aged and multi-story that the mosaic distribution, as described above, is achieved.

Additional details and objectives of skip and gap treatments within proposed Thinning units:

- Retention patches: The use of ground-based machinery (tractors and masticators) is prohibited within retention patches. Retention patches would retain forest canopy from 5 to 10 percent of each unit, clumped in 0.25- to 1.0-acre patches, strategically placed where there is evidence of culturally important gathering areas or TEK species habitats that would benefit from more forest cover or shade (i.e., gathering or elk calving areas). Where woodrat nests are found, choose 0.25 acres adjacent to retention patch to cut all tanoak sprouts less than 4-inch dbh to encourage re-sprouting and create future woodrat habitat where appropriate. These are also referred to as “Skips and Gaps”.
- Openings: Openings in the forest canopy would be created to increase heterogeneity and promote cultural vegetation. Traditional ecological knowledge data and on-site observations are used to locate openings in areas where TEK species or cultural vegetation would benefit from increased or filtered light. Locate in areas where conditions in the stand may already be less dense (e.g., encroached meadows). Improve quality foraging habitat for local elk populations and warmer sites by creating 0.5- to 1-acre openings. Where non-elk habitat and cooler sites are present, gaps would range from 0.25 to 0.5 acres.

Specific guidelines will apply to eight units that occur within 0.5 mile of known NSO activity centers. The following units (units 2421, 2456, 2474, 2480, 2105, 2110, 2225, and 2227) in the deficit cores would receive an 18-inch-dbh limit. Only the portion of the unit located within the 0.5 mile circle would receive this prescription. These units would

maintain post-treatment average overstory canopy cover of 60 percent in treatment units mapped as nesting/roosting habitat and would maintain an average overstory canopy cover of 40 percent in treatment units mapped as foraging or dispersal habitat.

Tree thinning would retain trees of all size classes retaining stands that are uneven-aged and multi-story.

Thinning treatments would generally favor retaining tree species in the following order: California black oak, white oak, sugar pine, madrone (especially large individuals), ponderosa pine, chinquapin, and tanoak (especially large individuals).

Retain all predominant and dominant trees within each unit.

Manual Treatments

The manual treatments would occur in a series of phased treatments (Table 7 and Appendix B). Manual and mechanical treatments are proposed as an initial entry to select for more fire tolerant species, lower fuels concentrations, and reduce potential for torching which would help control fire behavior during burning operations.

- The types of manual fuels treatments that are proposed for the 1st entry include Plantation Ladder fuel manual thinning (502 acres), non-plantation ladder fuel manual thinning (2,156 acres) and plantation and non-plantation ladder-fuel prescribed fire (1,491 acres).
- The types of manual fuels treatments that are proposed for the 2nd entry include manual thinning ladder fuel post mechanical and post mastication entries (1420 acres).
- The types of manual fuels treatments that are proposed for the 3rd entry would include the understory and jackpot burning in all mechanical, manual, and mastication units, where needed (4,078 acres)
- Maintenance entry would include the option of prescribed fire in mechanical and manual units, where needed (5,570 acres).

To achieve the desired results of low to moderate intensity, with minimal high intensity fire effects from prescribed burning, the majority of the project area would need to have mechanical or manual treatments completed prior to initiating prescribed fire treatments and underburning. Some of the project area is not accessible due to very steep terrain or is already in the condition (more open stands, no ladder fuels) that would achieve the desired effects from burning without any pre-treatments. Manual treatments include the use of hand held mechanized equipment (chainsaws, loppers) are utilized to thin and clear small diameter ladder fuels and to break up the continuity in areas of high concentrations of shrub species. Residual canopy closure would be maintained at 40-60% of existing conditions. Important cultural and ecological plant species would be targeted for enhancement wherever feasible. Manual treatments are proposed as an initial entry to prepare the ground for positive prescribed burning effects. Manual treatments generally occur in plantations where there is no opportunity for restoration bi-products (typically firewood and sawlogs). This can be due to the topography (not conducive to heavy equipment access) or in larger more mature stands where only smaller diameter fuel reduction is necessary to prepare the ground for follow up prescribed burning. Slash generated would be hand piled and burned (or scattered where concentrations are low) in preparation for understory or jackpot burning. Handpile dimensions are up to 5x5x5 feet in size, piled on slopes up to 65% and away from the drip line of predominate

trees. Piles are covered with paper and ignited during favorable weather conditions. It is expected that manual treatments would occur within riparian areas where appropriate. Most of the perennial and intermittent streams in the project area provide a natural obstacle to the rate of spread and consumption from understory/jackpot burning and may not require much treatment as the first entry. Where necessary for streamside protection, pile burning would be limited to within 50 feet of the active channel. Where thinning of small diameter ladder fuels is needed to insure positive prescribed burning effects this activity would be limited also to within 50 feet of the active channel. Proposed activities in riparian area are designed to not adversely affect stream temperature or water quality.

1st Entry for Proposed Manual Treatments

Plantation ladder fuel manual thinning- Approximately 502 acres (Prescription ID 4a) are proposed for this treatment. This treatment would reduce ladder fuels by breaking up the continuity of both vertical and horizontal fuels using manual methods in preparation for prescribed fire. . High priority treatment areas are those associated with strategic control features (private property, roads and ridges) and in areas identified as having unacceptably high fuel loading which would lead to negative prescribed fire effects. Small-diameter trees and shrubs (4 to 6-inches dbh depending on NSO habitat), would be manually cut from beneath overstory trees, and/or aggregations of small-diameter Douglas-fir plantation trees would be thinned or limbed. Spacing for leave trees should be approximately 16 feet apart.

Ingress/Egress and Roadside Fuelbreak Treatments

This is not an additive proposed treatment and will be part of the first entry to prepare the landscape for prescribed fire treatments. The goal of treatment is to reduce ladder fuels by breaking up fuel continuity (both horizontal and vertical) of high concentrations. High priority treatment areas are those associated with strategic control features (private property, roads and ridges) and in areas identified as having unacceptably high fuel loading which would lead to negative prescribed fire effects. Thin small diameter trees and shrubs (4" to 6"-inch dbh) and reduce ladder fuels. Maximum residual spacing of trees should be roughly 16 to 25 feet. Enhance diversity of species by thinning around true oaks, incense cedar, madrone, pacific yew, sugar pine and ponderosa pine when feasible in order to provide protection from negative fire effects. Reduce tanoak/hardwood clumps but retain largest 25 to 50 percent of live stems over 4-inch dbh per clump. Thin more heavily in areas where trees show thinning crowns. Use TEK data and other on-site indicators to further prioritize areas for varying levels of thinning in order to enhance resources and create heterogeneous conditions. *Feather treatment adjacent to access/egress routes and private property.* In close proximity to the access/egress route (within 150 feet), thin and pile (or lop and scatter) all material up to the allowable size limit. Within the outer buffer (150 to 300 feet from the road), retain wildlife cover by leaving approximately 30 percent of the total area untreated. Retention buffers may also occur near private boundaries if identified as needed by wildlife personnel. Hand piles on slopes up to 65 percent, hand piles in dimensions smaller than 5 feet by 5 feet should be created away from the dripline of predominant trees. Slash generated from the thinning may be hand piled or jackpot piled in dimensions larger than 5 feet by 5 feet to create openings but this action will be very site specific. Consider leaving piles unburned when adjacent to perennial or intermittent stream channels. Create or enhance openings roughly 0.25 to 0.33 acres in size when opportunities exist (*reference specifications for prescriptions above*). When feasible, maintain areas

of structural diversity (roughly 5 to 10 percent of the unit) as retention patches similar to prescriptions listed above.

Non-Plantation ladder fuel manual thinning- Approximately 2,156 acres (Prescription ID 4b) are proposed for treatment. This treatment would reduce ladder fuels by breaking up the continuity of both vertical and horizontal fuels using manual methods in preparation for prescribed fire. Small-diameter trees and shrubs, between 4-inch and 6-inch dbh (depending on NSO habitat type), would be manually cut from beneath overstory trees, and/or aggregations of small-diameter Douglas-fir plantation trees would be thinned or limbed. Spacing for leave trees should be approximately 16 feet apart.

Ingress/Egress and Roadside Fuelbreak Treatments

This is not an additive proposed treatment and will be part of the first entry to prepare the landscape for prescribed fire treatments. Treatment prescription along ingress/egress roads and roadside fuelbreaks would retain and thin small diameter trees and shrubs (4 to 6 inches depending on NSO habitat) and reduce density of intermediate and suppressed trees. Maximum residual spacing of trees should be roughly 20 to 24 feet. Enhance diversity of species by thinning around true oaks, madrone, Pacific yew, sugar pine and ponderosa pine when feasible in order to provide protection from negative fire effects. Reduce tanoak/hardwood clumps but retain largest 25 to 50 percent of live stems over 4-inch dbh per clump. Use TEK data and other on-site indicators to further prioritize areas for varying levels of thinning in order to enhance resources and create heterogeneous conditions. Thin more heavily in areas where trees show thinning crowns. Feather treatment adjacent to access/egress routes and private property. In close proximity to the access/egress route (within 150 feet), thin and pile (or lop and scatter) all material up to the allowable size limit. Within the outer buffer (150 to 300 feet from the road), retain wildlife cover by leaving approximately 30 percent of the total area untreated. Retention buffers may also occur near private boundaries if identified as needed by wildlife personnel or private landowners. Hand piles on slopes up to 65 percent, hand piles in dimensions smaller than 5 feet by 5 feet should be created away from the dripline of predominant trees. Slash generated from the thinning may be hand piled or jackpot piled to create openings. Consider leaving piles unburned when adjacent to perennial or intermittent stream channels. Create or enhance openings roughly 0.25 to 0.33 acre in size when opportunities exist (*reference specifications for prescriptions above*). Consider girdling to achieve desired opening where necessary. When feasible, maintain areas of structural diversity (roughly 5 to 10 percent of the unit) as retention patches similar to prescriptions listed above.

Ladder fuel Prescribed Fire (Rx burn) in Plantations and Non-Plantations- Approximately 1,491 acres (Prescription ID 5a) are proposed for treatment. It is acknowledged that not every acre of these units would be treated; however, prescribed fire would be used to break up the continuity of fuel loading and maintain existing openings where appropriate. Mixed severity is anticipated and control features and firing tactics would keep higher severity fire effects to less than 10 percent of the units treated, with fire as a first entry. Treatments in these areas would be conducted only after the fuelbreaks and other treatment unit work has been completed. Handlines would be constructed by manual methods prior to ignition. This type of burning would be initiated when fuel moistures are low enough to carry fire and still within prescription parameters.

NSO High Quality Nest/Roost (HQNR) Habitat

The proposed action would include manually treating 111 acres of HQNR habitat (See Appendix H) for treatment polygon locations. The HQNR habitat polygon boundaries of these polygons will be identified in the field prior to implementation. The acres treated for this habitat type are not additive the proposed action with HQNR polygons would have a modified prescription. The proposed prescription for HQNR habitat polygons would include cut, pile and burn material ≤ 4 inches and/or a low intensity underburn.

Proposed treatment units 2103 and 2291 occur within the core (0-0.5 mile) of activity centers AC1250 and AC1073 (See Appendix H). The HQNR polygons of an active core will not be treated if the site is occupied by NSO. If these cores are not occupied by NSO in a given breeding season then the proposed treatment would occur. Proposed treatment of HQNR polygons would occur in the homerange regardless if an NSO site was occupied.

Strategic Ridgetop Shaded Fuel Breaks and Handlines – Strategic ridges identified as important control features for prescribed burning and wildland fire response tactics. Cultural and ecological benefits are considered in prescription development. Similar to the access/egress shaded fuel breaks but narrower in scope. Strategic fuelbreaks and primary handlines have been identified and would be constructed under minimal impact guidelines following a path of least resistance. Where feasible, natural features, such as ridges, rock screes, riparian areas, game trails, and vegetation breaks will be utilized. Only small-diameter trees (6 to 8 inches) would be cut during handline installation. A general description of the fuelbreak activity would be a 100-foot-chainsaw brushing cut supported by a 2-foot-wide handline cut down to bare mineral soil. For handlines, a 6-foot-chainsaw brushing cut supported by a 2-foot-wide handline cut down to bare mineral soil. Waterbars would be added as needed to reduce concentration of water.

2nd Entry for Proposed Manual Treatments

Manual Thinning Ladder Fuel Post Mechanical and Post Mastication Entries– approximately 1,420 acres (Prescription ID 4c) would have proposed second entry in plantation—mechanical thinning (660 acres), non-plantation—ladder fuel mechanical thinning (573 acres), and plantation—ladder fuel mastication (187 acres) (Prescription ID 4c), where needed.

3rd Entry for Proposed Manual Treatments

Underburning

Approximately 4,078 acres (Prescription IDs 5a, 5b, and 5c) are proposed for third entry underburning treatments, if needed based on conditions on the ground.

Summary of the Proposed Action and Underburning:

- The proposed mechanical thinning treatments during implementation of the 1st entry are not expected to take the canopy cover down to minimum guidelines by habitat type (40% Foraging and dispersal and 60% N/R). In plantation and non-plantation stands an estimated canopy closure post-implementation of 1st entry treatments would be from 45-50% CC for dispersal and foraging habitats and 65-70% for N/R habitat.
- 2nd entry would include manual thinning of ladder fuels of 4-6 inch material within mechanical thinning units. The proposed treatment would cut, pile and burn ladder fuel within the stand. Approximately 30% of the understory within each unit would remain

untreated. This treatment would reduce ladder fuels and create a mosaic within the stand. This would help prepare the stand for understory burning without simplification of the understory.

- Third entry underburning would not occur until manual thinning of ladder fuels occurred within mechanical units and associated handlines and control features are in place for the remaining acres prescribed for third entry treatments.
- The proposed treatments are expected to be within a range that would permit fuel treatments that would not exceed our canopy cover recommendations by habitat type for NSO. Units and prescribed treatments, outcomes are described in the burn plan for each unit and signed by the line officer.
- Prior to ignition each treatment unit will be evaluated and some areas may not require additional treatments. Re-initiation of consultation maybe necessary if treatments take habitat below canopy cover recommendations.

Prescribed underburning involves the controlled application of fire to understory vegetation and coarse woody material. This would occur when fuel moisture, soil moisture, and weather and atmospheric conditions allow the fire to be confined to a predetermined area and intensity can be managed to achieve the desired resource objectives. Where no local features are present to contain prescribed fire (roads, trails, streams), hand fire line or a wet control line would be established along the outside edge of treatment burn areas. All the proposed 4,078 acres may not be implemented and will be based on field conditions and site specific assessments.

Jackpot Burning

Jackpot burning is the burning of discontinuous, concentrated areas of slash created from vegetation treatments or natural fuel concentrations. Burning would typically occur following an extended period of dry weather to allow the slash to cure for optimal consumption. Fuel concentrations would be burned just prior to or during wet weather conditions to ensure controlled fire.

Lop and Scatter

Lop and scatter is a method of slash reduction where down fuel accumulations and concentrations are manually cut and dispersed to a maximum depth of 18 inches (with chainsaws and hand labor). This places woody material in proximity to the soil, where decomposition and soil building processes occur.

4th Entry for Proposed Manual Treatments

Maintenance Burning

It is expected that following the final treatment entries, all units would require varying degrees of maintenance using prescribed burning to achieve project treatment objectives (5570 acres). The frequency of maintenance burning is generally expected to be from two (2) to seven (7) years after the third entry, once mechanical, manual and prescribed treatments have been completed.

The maintenance burn cycle would be based on the amount of short-term fuel loading buildup from field surveys relative to desired fuel conditions. Burning would be initiated when fuel

moistures are low enough to carry fire and still within prescription parameters for low to moderate intensity. Burning would only be initiated on “burn days” or with an approved variance.

Project Area Objectives

Prescribed burning would target the reduction of small diameter ladder fuels and breaking up the continuity of excessive fuel build up. Riparian areas would not be directly ignited, but fire would not be prevented from entering into it. If its determined that the initial fuel loading is too heavy in the riparian area to allow prescribed fire to enter, then handlines or “wet lines” would be temporarily employed to reduce the potential for adverse impacts to canopy closure, stream temperature and water quality. Follow up understory burn treatments would occur approximately every 2-7 years according to site specific objectives. See Appendix C for unit-specific treatment descriptions.

Roadside Hazard Trees

Incidental felling would only occur in the event they pose an immediate safety risk to firefighters or a containment risk during implementation. Hazards trees posing a risk to the public, loggers or operations would also be felled. Roadside hazard trees may be reserved for use for fisheries restoration, removed, or left on site. Hazard tree removal, would include approximately 1-5 trees per mile for one tree length from the road, following use of Regional hazard tree guidelines (Angwin et al. 2012).

Connected Actions

Temporary roads and landings – The proposed action would include the use of 160 landings (76 acres). Of this total 130 are existing landings (63 acres) and 30 are new landings (13 acres). Mechanically treated areas where a commercial by-product is anticipated require the use of temp roads and landings. The collaborative made every effort to utilize existing temp roads and landings. New temp roads were considered where the impact of creating new temp roads is minor and rehabilitation techniques would effectively eliminate the effects of a new linear feature on the landscape. For example, a new temp road that requires minimal clearing and has no stream crossings would be a scenario where this action was considered. Post project implementation would require that all temp roads and landings be left in a free draining condition, free of berms or other obstacles that would concentrate water during storm events. All temp roads would be blocked to eliminate motor vehicle access.

Temporary Road Construction/Reconstruction

Approximately 2.3 miles of existing mastication, 8.1 miles of existing temporary and 0.6 miles of new temporary road is proposed within the Project area.

Level 1 system road use – Maintenance level 1 roads would be brought into service and utilized as a maintenance level 2 road for the life of the project but closed to vehicle traffic during the wet weather season. Most roads require minor blading and roadside brushing prior to use. One road requires a new culvert and new rock fill prior to use (13N14A).

Water Drafting – In support of fuel reduction treatments, drafting would be discouraged in occupied Coho streams and requiring NMFS approved screens at appropriate drafting sites.

Handlines –Primary handlines have been identified and would be constructed under minimal impact guidelines following a path of least resistance. Where feasible, natural features such as ridges, rock screes, riparian areas, game trails and vegetation breaks will be utilized. Only small diameter trees (under 6”) would be cut during handline installation. General description of the handline activity would be a 6’ chainsaw brushing cut supported by a 2’ wide handline cut down to bare mineral soil. Snags and/or hazards trees would only be felled if they pose a safety risk to firefighters or a containment risk during implementation. Handlines will be constructed with waterbars and left in a free draining condition.

Fireline maintenance– The 1987 dozer line in Ti Creek is an example identified of an existing fireline that serves as an important strategic fireline for private land dwellings in the vicinity. Fireline would be maintained for multiple entries. These areas would be maintained as more of a “true fuel break” where most of the shrubs and small diameter trees are thinned up to 6 feet on either side of 2 foot wide bare mineral soil fireline, while retaining the larger trees to provide shade/canopy cover.

Treatment within LSR

The Somes Bar Integrated Fire Management Project occurs partially within LSR RC 349 Ten Bear and one 100 acre LSR KL0058. Under the 1994 Northwest Forest Plan, Standards and Guidelines (S&G) were developed for silvicultural treatments in Late Successional Reserves (LSR) in order to maintain or improve habitat conditions for late-successional species. For specific guidance on management within the LSR see the Forest-wide Late-Successional Reserve Assessment (LSRA). The Klamath National Forest Forest-wide Late-successional Reserve Assessment (1999) sets the objective that Fuels Management Treatments effects in LSRs must be neutral and should have a long-term positive effect on late-successional habitat. Proposed project treatments should not diminish suitable habitat now or in the future.

Late-Successional Reserve (LSR) treatment will include approximately 49 acres specifically in LSR Ten Bear RC349 and a 100 acre LSR KL0058. Treatment within Ten Bear LSR 349 includes 14 acres of manual Rx fuels (Units 2247 and 2252), and 11.9 acres of mechanical treatment with a 20” dbh limit (Unit 2249) in the Patterson project area. The Ti Bar project area will have 9.6 acres treatment with manual, Rx burn (Units 2107 and 2108). Treatment in Donahue project area will include 13.5 acres of manual Rx fuels (Unit 2440) in LSR100-KL0058 (Table 9).

One S&G required that all 20” dbh and above trees be maintained within the treated stands unless reviewed by the REO. In the July 9, 1999 letter, the REO allows “Individual trees ... exceeding 20-inches dbh in any province, shall not be harvested except for the purpose of creating openings, providing other habitat structure such as downed logs, elimination of a hazard from a standing danger tree, or cutting minimal yarding corridors.” The Somes Bar Integrated Fire Management Project meets LSR objectives for habitat protection and restoration, and will not need the exemption. The Somes Bar Integrated Fire Management Project will not cut trees over 20” dbh within LSR and will retain predominate and dominate trees.

Table 9. Units, Prescription Treatments, and approximate acres of Late-Seral Reserves (LSRs) in the Somes Bar Integrated Fire Management Project.

Unit	Acres in Unit	Rx Fuels	Approximate LSR Acres
2440	22.2	Manual, Rx Burn	13.5
2252	25.3	Manual, Rx Burn	12.8
2249	78.4	Mechanical - ground-based / Manual, Rx Burn	11.9
2107	4.8	Manual, Rx Burn	4.8
2108	5.0	Manual, Rx Burn	4.8
2247	14.0	Manual, Rx Burn	1.2
Total acres			49.0

Future Beneficial Effects for NSO and its Habitat

Since the mid-1980s, the frequency and intensity of high severity wildfire in the range of the NSO has increased (Miller et al. 2009, Schwind 2008, Westerling et al. 2006 cited in Davis et al. 2011). Moeur (2011) noted similar findings related to the loss of late-successional and old-growth forests favored by northern spotted owls.

The fifteen year monitoring report for the Northwest Forest Plan (Davis et al. 2011) noted that:

Although the relationship between wildfire frequency and severity on owl demography is not fully understood, habitat loss is the primary reason for the owl's decline and subsequent listing as "threatened" under the Endangered Species Act (USDI 1990). The habitat monitoring results presented in chapter 3 (this report) identified wildfire as the leading cause of current spotted owl nesting and roosting habitat loss (3.4 percent) and its future recruitment on federal lands. This was also the finding in the 10-year monitoring report (Davis and Lint 2005), and since completion of that report, several more large wildfires have occurred within the owl's range and more nesting/roosting habitat has been lost. Thus, loss of habitat to wildfire remains a significant concern for the management and conservation of the spotted owl.

The 2011 Recovery Plan for the northern spotted owl also noted habitat loss or degradation from stand-replacing wildfire as one of the most important range-wide threats to the northern spotted owl (USFWS 2011). Davis et al. (2015) mapped areas prone to future large stand-replacing fires, noting the Klamath Province and Western Klamath as geographic areas in Northern California most likely to experience large ($\geq 1,000$ acres) stand-replacing fires in the future. Multiple large fire events in this area have continued including the fires in 2017. These fires combined have resulted in the loss of many acres of nesting/roosting and foraging NSO habitat. Thus, it is well established that stand replacing, high intensity wildfire negatively affects NSO habitat within these regions of Northern California and that the potential for future habitat losses in this area is high. Given probable climate change scenarios, the rate of habitat loss from stand-replacement fire is likely to increase.

Recovery Action 10 in the NSO Recovery Plan directs agencies to consider both the short-term adverse impacts of fuels treatments and other activities, and long-term benefits (USFWS 2011). Long-term benefits include reducing the risk of future habitat loss from stand-replacing fire and actions that accelerate the development of regenerating habitat.

Although the previous sections of this document identify the more clearly discernible effects of the project on NSO and its habitat, there are several other potential beneficial effects that are difficult to estimate given the unpredictable nature of fire. The following project activities may have long-term benefits to NSO habitat because the treatments can reduce fire intensity and severity and enhance future fire management activities, including fire suppression, managing unplanned ignitions, and implementation of prescribed fire.

Strategic Fire Line Establishment: Ridgetop Modified Shaded Fuel Breaks and Handlines reduce the probability of large stand replacement fire from spreading from one drainage to another by providing pre-constructed zones in strategic locations. These pre-constructed zones provide locations for rapid fire-line utilization and burnout operations that would otherwise consume limited fire suppression resources and time during a fire. These strategically placed fire-lines are designated to play a critical role in contributing to fire suppression success.

Ridge-top Containment (Strategic Fuelbreak): These control features stop or contain planned prescribed fire during burning operations. During burning these defensible control lines act to hold or confine fire within the burn plan area. They also provide defensible control lines from which firefighters can safely intervene when responding to unplanned fire ignitions outside the project area.

Roadside Fuels Reduction: In combination with Strategic Fire Line Establishment, which typically occur on the ridgeline, roadside fuels reduction would provide a reduction in ladder fuel loading at multiple slope positions before a fire reaches the ridgeline. This action reduces the potential for ground fire to transition into the overstory canopy. In addition, roadside fuels reduction helps maintain ingress and egress for public safety and fire suppression effort. This contributes to reduced fire intensity along the treated roads and increases the probability of successful suppression.

Understory Prescribed Fire: Underburning consumes surface fuels and reduces fuel-ladders that contribute to crown fires. Crown fires are typically responsible for removing the upper canopy, thus resulting in a loss of NSO habitat. Future fires are less likely to become high-intensity, stand-replacing events where surface and ladder fuels have been reduced, thus avoiding the loss of suitable NSO habitat.

Project Design Features and Mitigation Measures

In order to meet standards and guidelines, minimize impacts to resources and implement project objectives design features and minimization measures were generated by the IDT. This Project is designed in compliance with the Aquatic Conservation Strategy (ACS) reflected in the Record of Decision and Standards and Guidelines of the Northwest Forest Plan (USDA and USDI 1994) as

incorporated into the Six Rivers National Forest Land and Resource Management Plan (USDA 1994), including relevant standards and guidelines identified in **Appendix A**.

Wildlife

- No project activities that modify NSO nesting/roosting and foraging habitat from February 1 to September 15, unless protocol surveys determine no nesting activity. If surveys result in determining no NSO nesting activity, this restricted project operations time period would be lifted for the year in consultation with the US Fish and Wildlife Service (USFWS).
- No project activities that result in creating noise above ambient levels within 0.25 miles of nesting/roosting and foraging habitat or within known NSO activity center cores from February 1 to July 9 on the KNF (Ukonom RD). No project activities that create smoke within 0.25 miles of nesting/roosting and foraging habitat within known NSO activity centers from February 1 to July 31 on the KNF (Ukonom RD). If surveys result in determining no NSO nesting activity or non-occupancy, this restricted project operations time period would be lifted for the year. This project design feature is not intended to be applied to motor-vehicle travel on roadways.
- No project activities that result in creating smoke or noise above ambient levels within 0.25 miles of nesting/roosting and foraging habitat or within known NSO activity center cores from February 1 to July 31 on the SRNF (Orleans RD). If surveys result in determining no NSO nesting activity or non-occupancy, this restricted project operations time period would be lifted for the year. This project design feature is not intended to be applied to motor-vehicle travel on roadways.
- NSO nest groves - No commercial treatments in any NSO nest groves.
- NSO habitat treatments: Maintain and average overstory canopy cover of 60 percent in treatment units mapped as nesting roosting habitat, and will maintain an average overstory canopy cover of 40 percent in treatment units mapped as dispersal and foraging habitat.
- During project design with the Level 1 team and the USFWS, it was determined that four NSO ACs (1250, 1073, 58 and 53) cores (0 to 0.5 mile) were deficit in habitat. The following commercial units in the deficit cores (See page 11, Table 5) would receive an 18-inch-dbh limit. These units would maintain post-treatment average overstory canopy cover of 60 percent in treatment units mapped as nesting/roosting habitat and would maintain an average overstory canopy cover of 40 percent in treatment units mapped as foraging or dispersal habitat.

- All High-quality nesting/roosting habitat as mapped within the project area will receive manual fuels treatments. The proposed treatment for high-quality nesting/roosting habitat would be cutting, piling, burning material ≤ 4 inches, and a low-intensity underburn. A high-quality nesting/roosting habitat polygon may occur in more than one unit (See Table 6, page 11) and only the portion of high-quality nesting/roosting habitat within the unit will be treated with this prescription.
- Goshawk surveys in the project area are in progress. During surveys, a nesting pair was detected—the units listed in Table 10 include the limited operating periods (LOPs) for this site. If nesting goshawks are found within 0.25 miles of any treatment unit, no noise- or smoke-generating activities (e.g., timber harvest, heavy equipment use, chainsaw use, burning) would occur within 0.25 miles of the occupied site between March 1 and August 31.

Table 10. Northern goshawk limited operating period (LOP) for all entries.

Project Area	Unit	Treatment Method
Rogers Creek	2323	Manual & Prescribed Fire
Rogers Creek	2328	Mechanical, Manual & Prescribed Fire
Rogers Creek	2334	Manual & Prescribed Fire
Rogers Creek	2335	Manual & Prescribed Fire
Rogers Creek	2336	Mechanical, Manual & Prescribed Fire
Rogers Creek	2340	Prescribed Fire
Rogers Creek	2341	Prescribed Fire

- Bald eagle nest surveys are in progress. During surveys, a nesting pair was detected—the units listed below include the LOPs for this site. If bald eagles are detected in or adjacent to the project area, no noise- or smoke-generating activities (e.g., timber harvest, heavy equipment use, chainsaw use, burning) would occur within 0.25 miles of the occupied site from January 1 and August 31. This applies to Units 2134, 2135 and 2139.
- Fisher, marten and wolverine surveys have been conducted with camera stations. Detections of marten and fisher have been documented in the project area. Although no den sites have been located, if a den is found, no project activities associated with loud noise above ambient levels or smoke-producing activities would occur within 0.25 miles from February 1 to May 31 adjacent to an active den site.
- Protect other known or discovered raptor nest sites from management activities and human disturbance until fledging has been documented. Levels of protection vary by the requirements of the species involved. A Forest Service biologist will be notified if a raptor nest is discovered during implementation and appropriate steps will be taken.
- Snags and logs would be retained per KNF LRMP S&Gs Table 4-4, and KNF LRMP FEIS Table I-1 provides standards for snag retention. The KNF LRMP guidelines recommend five (5) snags per acre averaged across a 100-acre area. This site-specific recommendation (FEIS Table I-1) advises that NSO high-quality habitat would have eight (8) snags per acre on an average area basis. Each acre need not meet these

standards. Five (5) to eight (8) snags per acre on south facing slopes and the higher standard (8 snags/ac) being applied to nest grove and high-quality nesting/roosting habitat.

- Snags and logs would be retained as per Six Rivers National Forest Land Resource Management Plan, Standard and Guidelines Table IV-8, and Appendix L. Treatments within Late-Successional Reserves, Riparian Reserves, Critical Habitat Units, and suitable Northern spotted owl habitat (regardless of land allocation) would maintain snags (20" dbh and greater or the largest available in younger seral stages) and downed logs (20" and greater and at least 10 feet long or the largest available) at the 80 to 100% level, unless they pose a safety hazard or would not meet fuel treatment objectives. Hazard trees are defined as any tree that is dead, dying, or showing signs of failure that has the potential to hit the area of operations (leaning toward the site and is within tree-height distance).
- Maintain five (5) to 20 pieces of coarse woody debris (CWD) per acre in various stages of decay, and leave large logs (conifer and hardwood) at least 20 inches in diameter and about 40 cubic feet in volume when they are available.
- No snags will be cut during implementation, unless they present a particular safety issue that cannot be avoided.
- Slash will not be piled against large trees or snags to reduce loss of structural elements during prescribed burning.
- All predominant and dominant tree species would be retained. The project would not remove potential threatened, endangered, and sensitive species (TES) nest trees or affect the canopy around potential nest trees in suitable habitat. Directional falling would be used to protect all predominant trees and any tree forming a canopy around the predominant tree
- Roadside fuelbreaks and Ingress/Egress fuelbreaks (300 feet each side of the road) would retain approximately 30 percent of uncut understory vegetation to provide cover for other wildlife species. Leave about 30 percent of existing understory vegetation in a mosaic pattern that features more leave patches in the latter half (150 feet to 300 feet) of the fuelbreak.
- Shaded fuelbreak construction may occur in suitable TES habitat. No overstory trees or overstory canopy would be removed; however, in areas where the existing overstory canopy closure is low (but greater than 40%) treatments in secondary or understory canopy layers should maintain a minimum overall canopy closure of 60 percent.

Implementation and Effectiveness Monitoring

The overarching goal of monitoring the *Somes Bar Project* is to evaluate the effectiveness of treatments in achieving desired condition and function, including reintroduction of fire as a step towards restoring and maintaining resilient ecosystems, communities, and economies in the interest of revitalizing balanced human relationships with our dynamic landscape.

Because the WKRP is dedicated to shared-learning, the *Somes Bar Project*'s multi-party monitoring (MPM) strategy is the primary way for the partnership and the community to learn about—and from—the project. The monitoring effort will be led by the MPM team comprised of diverse participants that may include

representatives from the Karuk Tribe, Forest Service, Klamath Forest Alliance/Environmental Protection Information Center (KFS/EPIC), Salmon River Restoration Council, MKWC, local K-12 students, Humboldt State University or other university students, and community volunteers (Figure 1).

The partnership has identified two (2) types of monitoring that will take place throughout the project: 1) *implementation* and 2) *effectiveness*. Although *validation* monitoring is beyond the scope of this project, the partnership will pursue this type of monitoring with the help of researchers. The MPM team will meet annually to determine monitoring priorities. Based on team capacity, there are several components within each monitoring type that may be included. This capacity is largely dependent on funding availability. The question(s) related to each component link to the Purpose and Need, as well as the three goals of the Cohesive Strategy. The data for monitoring will be housed by the WKRP data steward and available upon request. Table 11 lists the types of monitoring and the components that may be monitored.

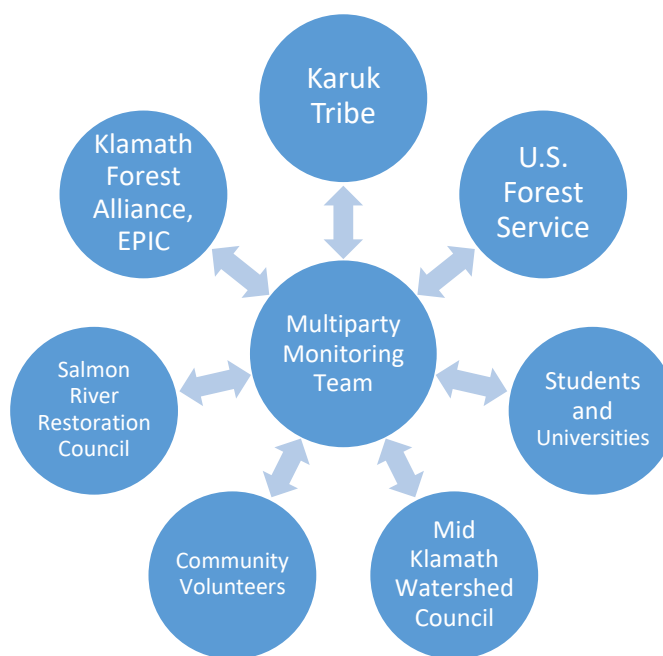


Figure 1. Schematic of multi-party monitoring strategy.

Table 11. Types of monitoring and the components that may be used for the *Somes Bar Project*.

Monitoring Type	Component	Component
Implementation: Did we do what we said we were going to do?	Prescribed burning	Invasive weeds
	Temporary roads	Collaborative process
	Landings	Implementation mechanism(s)
	Equipment exclusion zones	Workforce
	Canopy cover	Project protocols and contract specifications

Monitoring Type	Component	Component
	Skyline corridors	Riparian Reserves
	Ground disturbance	Aquatic Conservation Strategy objectives
	Accomplishments (e.g., acres)	
Effectiveness: Did our treatments meet the purpose and need?	Prescribed burn effects	Canopy cover
	Oak enhancement	Ingress/egress
	Food species	Youth Involvement
	Basket materials	Collaboration
	Heterogeneity	Social acceptance of fire
	Invasive weeds	Notifications for work
	Fire Function	Fuels reduction on private land
	Fuel hazards (private properties, ingress/egress, ladder)	Public satisfaction
	Northern spotted owl habitat	Access to food and materials
	Elk habitat	Restoration byproduct revenue
	Fisher habitat	Demographics of workforce
	Salamander habitat	Jobs created
	Willow habitat	Jobs retained/sustained
	Snags	Training opportunities
	Ladder fuels	Avoided costs
	Tree-size composition	
Validation: Larger questions that are outside the scope of this project, but may be pursued concurrently.	Tree growth/basal area	Sustained cultural practices
	Structural heterogeneity	Fisher as spotted owl surrogate
	Wildlife habitat connectivity	Elk population viability
	Bird assemblages	New resource areas
	Adverse effects	

V. EXISTING ENVIRONMENT

The Somes Bar Integrated Fire Management Project is located along the Klamath River Corridor and the closest community is Somes Bar, in Siskiyou County in Northern California. The area proposed for treatment (~5,570 acres Project Area) occurs within Subunit K LW7 of the NSO Critical Habitat Unit 09 (Klamath West) (USDI Fish and Wildlife Service 2012). The Action Area for NSO is 46,243 acres of which 37,447 acres occurs within two Critical habitat subunits. A portion of Subunit K LW6 (2,867 acres) of the Critical Habitat Unit 09 (Klamath West) occurs within the Action Area. No proposed treatment would occur in sub-unit K LW6. The remaining 34,580 acres is K LW7 and proposed treatment would occur in this sub-unit. Late-Successional Reserve (LSR) treatment will include approximately 49 acres specifically in LSR Ten Bear RC349 and a 100 acre LSR KL0058. Treatment within Ten Bear LSR 349 includes 24 acres of manual Rx (prescribed burn) fuels and 11.9 acres of mechanical treatment in the Patterson focal area. Treatment in Donahue focal area would include 13.5 acres of manual Rx fuels in LSR100-KL0058. The Somes Bar Integrated Fire Management Project area is dominated by dense early- and mid-successional habitats (53 percent), with late-successional habitats comprising about 24 percent of the area. An estimated 1,369 acres of late-successional habitat and about 2,969 acres of mid-successional habitat occurring within the four Focal Areas (Ti-Bar, Patterson, Rodgers, and Donahue). Within the treatment area the primary objectives are treating dense early and mid-seral stands, enhancing resiliency of oak woodlands, reintroducing fire, and to establish functioning resilient heterogeneous forests at multiple scales.

The forest conditions of the Somes Bar Integrated Fire Management Project Area is representative forested conditions resulting from natural ecological processes (i.e. fires), past management, and fire suppression. Approximately 3,079 acres of federal and non-federal timber harvest have occurred in the Watersheds since 1966. These projects were implemented prior to the 2012 Critical Habitat Rule and the habitat has been reevaluated and included in this analysis. Most plantation and natural stands identified for thinning are uniformly dense and lack horizontal and vertical diversity. Non-plantation (“minimally-managed”) stands commonly have scattered trees exceeding 30 inches diameter at breast height (dbh), contain a mix of size classes, large logs and snags, and contain conifer and hardwood species diversity. Identified plantation stands contain densely spaced trees with interlocking crowns; therefore, the growth potential under current conditions is limited.

The ecological diversity found throughout the Western Klamath Mountains is reflected in diversity of vegetation types and terrain in the Somes Bar Integrated Fire Management Project area. Forest stands occur as a result of soil type, aspect, disturbance history, and slope position. Currently vegetation diversity is high but the structural diversity is lacking in many areas. This lack of structural diversity is primarily due to the absence of naturally-occurring mixed severity fires and the stand complexity resulting from this type of disturbance. Large residual conifer and hardwood trees are scattered through the stands that are dominated by mid-successional trees throughout the Project Area, the majority of which are surrounded by small and mid-sized Douglas firs. Young dense conifer plantations (1960s through early 1990s) have not yet been thinned and are scattered throughout the project area. In addition, without the influence of naturally-occurring mixed severity fire oak woodlands have become encroached with conifer.

Species Account

Presence or absence of the species in the project area is based on the known range of each species, habitat suitability, surveys information, records in the Six Rivers National Forest Wildlife Sighting Database, the Forest’s Geographic Information System (GIS) vegetation and wildlife species layers and incidental observations.

See the Forest-wide Reference Document (Appendix A) for species life history information.

Northern Spotted Owl (*Strix occidentalis caurina*)

Status: Federally Threatened

NSO Recovery Plan

On June 28, 2011, the FWS released the *Revised Recovery Plan for the Northern Spotted Owl (Strix occidentalis caurina)*. The purpose of recovery plans is to describe reasonable actions and criteria that are considered necessary to recover a listed species. The 2011 Revised Recovery Plan for the Northern Spotted Owl represents the “best available science.” The 2011 RP recognizes the importance of maintaining, and restoring, habitat for the recovery and long-term survival of the spotted owl. The 2011 Recovery Plan relies on Federal lands to provide the major contribution for recovery (USDI Fish and Wildlife Service 2011).

The purpose of recovery plans is to describe reasonable recovery criteria and recovery actions that are considered necessary to recover a listed species. Recovery criteria serve as objective, measurable guidelines to assist in determining when an endangered species has recovered to the point that it may be downlisted to threatened, or that the protections afforded by the ESA are no longer necessary and the species may be delisted. Recovery actions are the Service's recommendations to guide the activities needed to accomplish the recovery criteria.

The 2011 RP recognizes the importance of maintaining, and restoring, habitat for the recovery and long-term survival of the spotted owl. The 2011 Recovery Plan relies on Federal lands to provide the major contribution for recovery (USDI Fish and Wildlife Service 2011).

The RP states due to “The continued decline of the spotted owl populations and low occupancy rates in large habitat reserves, and the growing negative impact from barred owl invasions of spotted owl habitats (Forsman et al. 2011, Dugger et al. 2016), which is greater than anticipated in the NWFP. We recommend increased conservation and restoration of spotted owl sites and high-value spotted owl habitat to help ameliorate this impact”.

The Somes Bar Integrated Fire Management Project was designed to meet the objectives of the 2011 RP as follows:

Recovery Action 10

Because the SRNF strives towards recovery of the spotted owl, *all* NSO ACs receive the highest level of protection. This goes beyond the requirement of the RA 10 of the 2011 RP. There are 10 known NSO ACs included in the Action Area for the Somes Bar Integrated Fire Management Project. Care was taken to avoid habitat downgrade or removal within deficit NSO ACs, and no NSO ACs will be taken (indirect or direct) as a result of habitat treatments. Commercial and Fuel treatments will not remove or downgrade suitable nesting/roosting or foraging habitat. In addition, the USFWS requires a 70-acre nest grove protection zone. In this project we exceeded 70 acres around each known AC, which was incorporated into the project design (see the Biological Assessment for the project for specific information relating to nest groves). No commercial treatment will occur within the nest groves.

Recovery Action 32 states:

Forsman et al. 2011 recommended that all potential NSO habitats should be considered, not just old-growth. The Six Rivers definition of suitable nesting/roosting (N/R) NSO habitat includes mid-mature (starting at 21” DBH), late-mature and old-growth seral stages. All potential habitat was considered during project evaluation, and all high quality habitat (no matter what seral stage) was considered during project design. Low quality habitats were evaluated for habitat improvements measures. If the habitat could benefit from a silvicultural or fuels treatments, then it was considered for the project.

The definition of NSO habitat used for this project was based on the definition found in the SRNF LRMP, 2011 RP and field verified by biologists with extensive experience with the species. The LRMP, and 2011 RP definitions were based on the extensive amount of published literature and represents the best available science for the Six Rivers habitat types.

All high-quality NSO NR habitat and nest groves were dropped from commercial treatment on this project. Commercial and Fuels treatments within and adjacent to these areas will help protect existing high-quality NRF habitat from human-caused and wild fires. This project meets the intent of Recovery Action 32 and the need to reduce inter-specific competition between spotted and barred owls.

Recovery Action 6:

The Somes Bar Integrated Fire Management Project is designed to restore and accelerate development of important habitat characteristic for the spotted owl. This includes plantations and overstocked stands that, if treated, will increase the available habitats for the spotted owl and help reduce inter-specific competition between the barred owl and the spotted owl. Treatment of these stands would have an immediate benefit to the spotted owl. This project meets the intent of Recovery Action 6 by reducing fuel loading in dense plantations and by increasing development of important habitat components for the northern spotted owl.

In addition the proposed project treatments would meet or exceed the KNF & SRNF LRMP guidelines. The KNF Plan recommends 5 snags per acre averaged across a 100 acre area (Table 4-4 of the KNF LRMP and Table I-1 of the LRMP FEIS provide standards for snag retention). The project would meet or exceed the KNF Forest Plan Chapter 4 pg. 4-25 standard and guide 6-16 for coarse woody debris.

- Maintain 5 to 20 pieces of CWD per acre in various stages of decay.
- Leave large logs, conifer and hardwood, sound and cull of at least 20 inches in diameter and about 40 cubic feet in volume when they are available. Down logs should reflect the mix of species in the stand.

The Somes Bar Integrated Fire Management Project has protected all high quality habitat (not just old-growth, but also late mature and some mid mature stands, RA32), all spotted owl territories (not just high priority sites, RA10) and is designed to restore and accelerate important habitat characteristic for the spotted owl (RA6) in young overstocked stands. Such long-term protection of owl habitat is consistent with the recommendations in the 2011 Recovery Plan.

The 2011 Recovery Plan states “Dugger et al. 2016 found an inverse relationship between the amount of old forest within the core area and spotted owl extinction rates from territories” when barred owls were present. The RP also states due to the “growing negative impact from barred owl invasions of spotted owl habitats (Forsman et al. 2011, Dugger et al. 2016) ... We recommend increased conservation **and restoration of spotted owl sites and high-value spotted owl habitat to help ameliorate this impact**” (emphasis added). Barred owls have been documented using a wider range of forest types (younger seral stages with more fragmentation) than spotted owls (Hamer 1988, Herter and Hicks 2000, Kelly et al. 2003, Hamer et al. 2007, and Irwin et al. 2018). Consequently, the loss of late-successional old-growth forest and increased fragmentation of these forests will decrease the amount of suitable habitat for spotted owls. In other words, without treatment of non- or poor-quality habitats in deficit core areas we may lose these sites to barred

owls. The Recovery Strategy of 2011 Recovery Plan supports “active forest management” and states that “In addition to describing specific actions to address the barred owl threat, this Revised Recovery Plan continues to recognize the importance of **maintaining and restoring high value habitat for the recovery and long-term survival of the spotted owl.**” (Emphasis added).

The Somes Bar Integrated Fire Management Project treatments within owl territories, including core areas, are designed to accelerate the development of old forest characteristics, and increase structural diversity which will improve habitat conditions within spotted owl territories. The project meets the objectives of the 2011 Recovery Plan.

Rangewide threats:

Barred owl

Rangewide, barred owls are recognized as a significant threat to the recovery of the NSO (USFWS 2011). The RP addresses barred owls under RA 32 and RA 10 which are found under the “Barred Owl Recovery Actions”. The barred owl recovery actions were developed under the assumption that barred owls now occur at some level in all areas used now or in the past by spotted owls. This is true for the Somes Bar Integrated Fire Management Project area as well. Northern spotted owl surveys within the Somes Bar Integrated Fire Management Project area has shown barred owl occupancy within the project area. The 2011 RP addresses the threat to the NSO from the barred owl through the preservation of existing high quality habitat (RA 32) and preservation of high priority NSO territories (RA 10). The RP also addresses the need to restore additional habitat for the owl in order to ameliorate the impact of the barred owl. Implementation of RA 10 and RA 32 standards fully meets the best available barred owl mitigation measures by protecting, maintaining and restoring spotted owl habitat.

The 2011 RP was informed by Forsman et al. 2011 and Dugger et al. 2016. The RP states due to “The continued decline of the spotted owl populations and low occupancy rates in large habitat reserves, and the growing negative impact from barred owl invasions of spotted owl habitats (Forsman et al. 2011, Dugger et al. 2016, Holm et al. 2016, and Irwin et al. 2018), which is greater than anticipated in the NWFP. We recommend increased conservation **and restoration of spotted owl sites** and high-value spotted owl habitat to help ameliorate this impact”.

Recovery Action 32 specifically states: “**Maintaining or restoring forests with high-quality habitat will provide additional support for reducing key threats faced by spotted owls**” and “Protecting these forests should provide spotted owls high-quality refugia habitat from the negative competitive interactions with barred owls that are likely occurring where the two species’ home ranges overlap. **Maintaining or restoring** these forests should allow time to determine both the competitive effects of barred owls on spotted owls and the effectiveness of barred owl removal measures”. All high-quality stands were dropped from commercial treatment on this project due to this recovery action and the need to reduce inter-specific competition of the owls and restoration activities are proposed for non-habitat or low-quality habitat stands.

Recovery Action 10 requires that agencies “Conserve spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl population”. Maintaining all historic ACs is a standard SRNF and KNF protection measure. The SRNF and KNF database includes NSO ACs that predates the 1990 listing of the NSO. All historic ACs (currently occupied

or not) that meet the criteria of an AC (described in the USFWS survey protocol) are considered during project evaluation. Within the NSO action area for NSO the area has 14 historical ACs mapped. Ten of these ACs were included in the analysis for this project. The other four NSO ACs were dropped from analysis due to location and review by the Level 1 team. All 14 ACs were found to be active at some point in time from as early as the 1990's. To date the project area has had 3 years of surveys to protocol (2015 to 2017). No NSO were detected at any of these sites in 2017. All high quality NR habitat, regardless if it was located within an active AC, was dropped from commercial consideration during project design. In addition, the USFWS requires a nest grove protection zone of a minimum of 70-acres around each known AC, which was exceeded for this project and incorporated into the project design. No commercial activities would occur within the nest groves. The Somes Bar Integrated Fire Management Project meets Recovery Action 10.

The Somes Bar Integrated Fire Management Project has protected all high quality habitats (not just old-growth), all spotted owl territories (not just high priority sites) and is designed to restore, maintain, and accelerate important habitat characteristic for the spotted owl. "Maintaining or restoring these forests should allow time to determine both the competitive effects of barred owls on spotted owls and the effectiveness of barred owl removal measures" (II-67 of the 2011 Plan). Protecting these forests should provide spotted owls high-quality refugia habitat from the negative interactions with barred owls that are likely occurring where the two species' home ranges overlap. The Somes Bar Integrated Fire Management Project would not exacerbate competitive interactions between the two species. Without the implementing the additional protection measures and recovery actions of the 2011 RP, the barred owl may be successful in out-competing the spotted owl. It is imperative to the spotted owl's recovery to take such actions. The Somes Bar Integrated Fire Management Project is meeting the objectives of the 2011 RP.

Fire

Another threat to the NSO addressed by the 2011 Recovery Plan is wildfire. The 2011 RP identifies stand-replacing wildfire as one of the three top threats to the recovery of species stating "currently the primary source of habitat loss is catastrophic wildfire" The RP further notes that wildfire size and frequency have been increasing in the western US and that acres burned are expected to continue to increase due to climate changes and past land management practices. This overall increase in acres burned translates to a corresponding increase in the acres of spotted owl habitat lost to fire. While the risk of habitat loss to wildfire varies by location, the 2011 RP emphasized that the Klamath region is one of the main areas at risk:

"fire-prone provinces (including) California Klamath scored high on threats from ongoing habitat loss as a result of wildfire and the effects of fire exclusion on vegetation change."

"In view of the increasing risk posed to northern spotted owl habitat by wildland fire in the dry forests of the California Klamath Province, the Recovery Plan calls for management actions that result in forests that are more fire resilient and fire-resistant."

However, the area's dry, hot summers and extreme departure from its historic fire return interval mean that owl habitat within many areas of the Forests is at risk of being lost to, or significantly modified by, severe uncharacteristic fire. The 1999 Megram Fire (120,000 acres), 2002 Biscuit Fire (500,000 acres), the 2008 Lightning Complex (45,000), 2013 Butler (22,932 acres), 2013 Salmon Complex (15,004 acres), 2014 Beaver Fire (32,307 acres), 2014 Happy Camp Complex (131,389 acres), 2014 Man Fire (15,645 acres), 2014 July Complex (3,362 acres), 2014 Little Deer (5,503

acres), 2015 Saddle Fire (1,541 acres), 2015 Fork Complex (36,562 acres), 2015 Mad River Complex (5,746 acres), 2015 River Complex (71,493 acres), 2015 Route Complex (17,095 acres), 2015 South Complex (28,724 acres), 2016 Pony Fire, 2016 Gap Fire, 2017 Orelans Complex, and the 2017 Marble Fire (319 acres) and many other fires within the range of the species that has removed or downgraded suitable NSO habitat demonstrates that fire risk on the Forests and within the range of the species is genuine (Davis et al. 2015, Davis 2015). Active management to reduce the fire hazard and increase resilience, as well as to accelerate the development of higher quality NSO habitat, should contribute to the spotted owl's persistence and recovery. Such long-term protection of owl habitat is consistent with the recommendations in Forsman et al. 2011 as well as the 2011 Recovery Plan and 2012 Revised NSO Critical Habitat Rule.

Impacts to Pacific Northwest forests from wildfire appear to be increasing along with fire occurrence, size, and intensity. Although some researchers disagree on the magnitude of these changes and what to do about them (e.g., Hanson et al. 2009, Hanson et al. 2018, Jones et al. 2016, and Rockweit et al. 2017), most researchers believe, as does the USFWS (USDI 2012b), that these changes are happening, and that active management should be considered (e.g., Hessburg et al. 2007, Healey et al. 2008, Heyerdahl et al. 2008, Kennedy and Wimberly 2009, Latta et al. 2010, Littell et al. 2009, 2010, Spies et al. 2010, Perry et al. 2011, Syphard et al. 2011, Waring et al. 2011, Jenkins et al. 2012, Marlon et al. 2012, Miller et al., 2009, 2012). Thus, this project takes the active management intervention approach rather than a passive approach to restoring NSO habitat. This approach is what was envisioned by the Northwest Forest Plan, the 2011 NSO RP, and the 2012 Revised NSO Critical Habitat Rule.

Prey Species

In this portion of the northern spotted owls range (below about 4100 feet in southern Oregon and northern California), dusky-footed wood rats (*Neotoma fuscipes*), are the most important prey species of spotted owls, both in frequency and biomass (Forsman 1975, Barrows 1980, Solis 1983, Forsman et al. 1984, Ward 1990, Carey et al. 1992, Zabel et al. 1995, Ward et al. 1998 Forsman et al. 2004 and Hansen and Mazurek 2010).

In a study conducted on the Six Rivers National Forest, Sakai and Noon (1993) found the highest abundance of woodrats occurred in 15-30 year-old plantations resulting from past clearcut timber harvest. The study used radio telemetry to track the movement of woodrats and found that although the woodrats inhabited younger stands, woodrats would often cross distinct ecotonal boundaries between forest types. Woodrats tracked during evening telemetry sessions made intermittent, short distance movements into adjacent old-growth forests occupied by spotted owls. A substantial number of radio tagged woodrats were killed by predators, with carcasses most often found in adjacent old forest. This is presumably due to the fact that these younger, dense plantations are difficult if not impossible for the owl to forage in and must wait until the prey leave these refugia to be preyed upon.

Ward et al (1998) found that owls foraged along late-seral forest edges where dusky-footed woodrats were more abundant. Woodrats living in or dispersing from adjacent shrub lands may be more available for owls hunting along the ecotonal edges between habitat types. Edge or transitional habitats appear to be more important to foraging spotted owls when woodrats dominate the diet (Zabel et al. 1995, Ward et al. 1998). Edges may provide cover to conceal owls from predators while making them inconspicuous to wood rats.

These results suggest that the infrequent use of younger stands by foraging spotted owls is not due to low abundance of prey. Simply increasing prey densities within a stand may not result in an increase in prey available to spotted owls if their foraging efficiency is low in these stands (Rosenberg, Noon and Zabel 1994). High tree densities and homogeneous canopies in second-growth forests may reduce flight maneuverability and the ability of owls to capture prey (Rosenberg and Anthony 1992). However, silvicultural procedures that maintain or enhance woodrat populations adjacent to spotted owl habitat may benefit spotted owls (Sakai and Noon 1993, Irwin et al. 2007).

Stands occupied by woodrats gradually decline in suitability. Data from Sakai and Noon (1993) suggest that this occurs when the dominant trees (usually Douglas-fir) begin to over top and eventually suppress the low-to-mid-canopy level vegetation (< 3-6 m). In the inland forests of northwestern California, the decline in habitat quality occurs in regenerated stands at about 40-50 years after harvest. To enhance dusky-footed woodrat populations, Sakai and Noon proposed retaining brush patches during precommercial thinning and creating brush patches in younger stands. The existence of shrub fields or younger stands adjacent to older forest may increase the availability of woodrats to spotted owls that exploit prey from a variety of habitats but spend the majority of their time hunting in late seral stage forests (Sakai and Noon 1993).

The northern flying squirrel (*Glaucomys oregonensis* Arbogast et al. 2017) is a smaller component of the biomass collected by the spotted owl in this portion of the province. In northwestern California, flying squirrels constitute only 9.3% of the biomass of NSO diet, while dusky-footed woodrats constitute 70.9% of the biomass of NSO diet (Ward et al. 1998).

Forsman et al. 1984 described potential negative impacts to flying squirrels through the timber harvest; however the conditions described by Forsman occurred in heavily thinned mature and old growth stands. No high quality nesting/roosting habitat is being commercially treated during implementation of the Somes Bar Integrated Fire Management Project. Thinning might also affect flying squirrels through reduction or development of other important resources, such as shrubs, hardwoods, arboreal lichens, or deformed trees and snags (Williams et al. 1992, Carey 1995). The Somes Bar Integrated Fire Management Project will protect these important habitat components. Hansen and Mazurek (2010) found “mixed” results in relation to the flying squirrel, with some studies showing no effect at all from the thinnings compared to unharvested stands.

NSO Habitat

Suitable NSO nesting/roosting (N/R) habitat, as defined by the Forest Service, is comprised of mature timbered stands having multi-layered conditions, an average canopy closure of 60 percent or greater (both conifers and hardwoods, but with at least 40% conifer cover) and obvious decadence. The overstory should be comprised of conifer trees 21 inches or greater diameter at breast height (dbh). This definition shows its accuracy when compared to the actual nest locations on the SRNF where it is the predominant type used by nesting spotted owls.

Nests are usually in snag cavities or broken tops of large trees in mature/old-growth forest. Daytime roost sites in northern California are in dense, multi-layered canopy forests, and average 550 feet from water.

NSO forage in forested habitats with hunting perches and a stand structure that allows for flight in the understory and access to prey. NSO will also forage in N/R habitat; however, foraging-only habitats include younger seral stages (early mature stands 70 years and older, at least 11" dbh and at least 40% canopy closure).

The average home range of the northern spotted owl is 3,398 acres in this portion of its range, which equates into a circle with a 1.3 mile radius from the center of the territory or "activity center" (AC). Research indicates that the most activity within a territory occurs within 0.5 miles of the nest tree. Northern spotted owl territories with at least 400 acres of suitable nesting/roosting/foraging habitat (250 acres N/R and 150 acres F) within 0.5 miles and 1,340 acres within 1.3 miles (550 acres NR and 785 acres F) of the nest tree are generally thought to have a higher chance of occupation. (**Appendix A** and references therein).

NSO Activity Centers occurring within the Somes Bar Integrated Fire Management Project

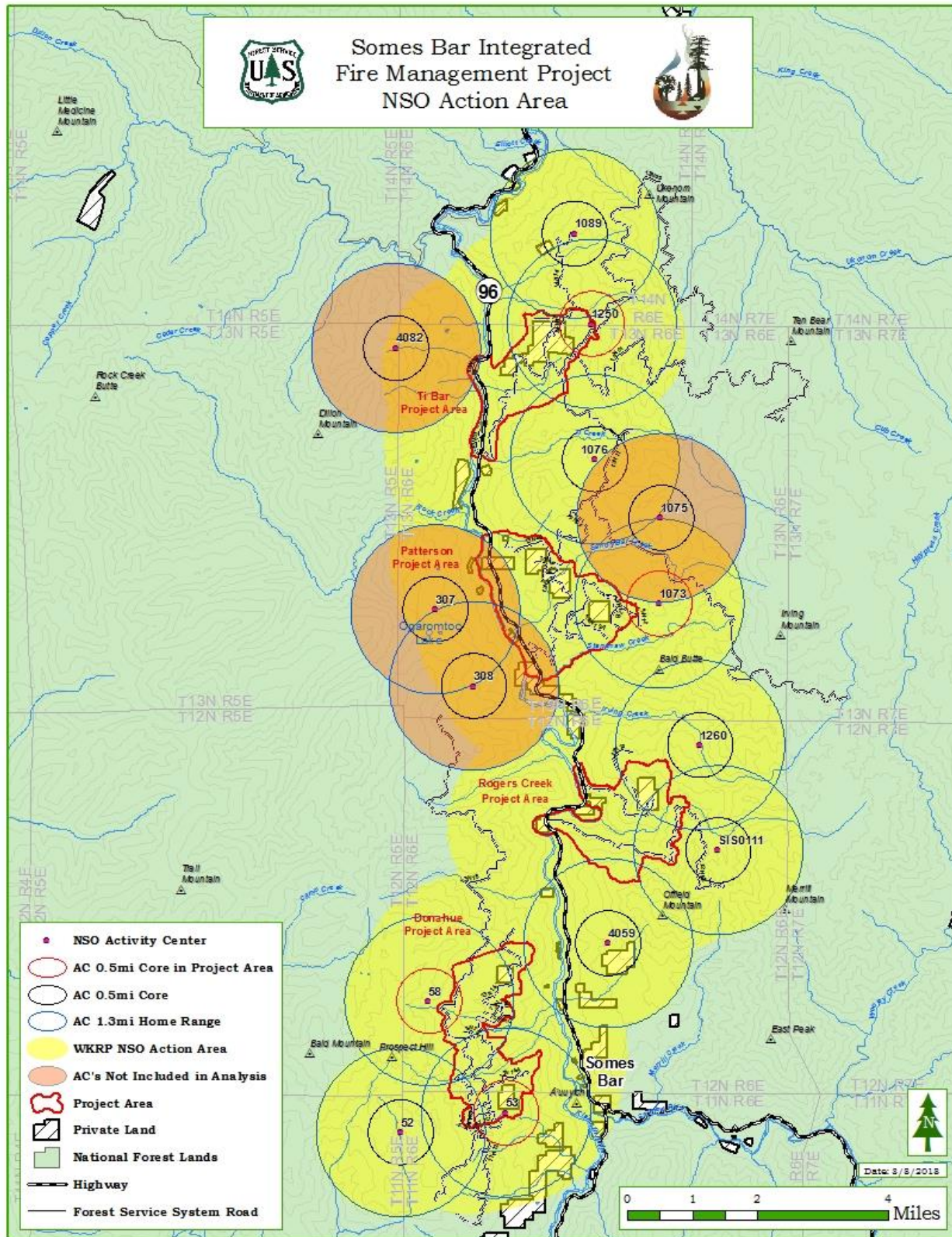


Figure 2. Overlay of action area and northern spotted owl Activity Centers. Activity Centers in Orange were not included in the analysis.

Of the 14 NSO home ranges that overlap with the action area, four were not included in the NSO analysis per Level 1 discussion, as three of the Activity Centers (ACs 4082; 307 and 308) occurred on the west side of the Klamath River and one (AC 1075) was 1.27 miles from the Patterson Project Area boundary with overlapped of less than 1% of the home range (Figure 2). Of the four core areas (0.5 mile radius) that overlap with the proposed project areas all four are deficient in the combined 400 acres of NRF habitat (Table 12). All ten home ranges (1.3 mile radius) are not deficient in NRF habitat, and all ten home ranges are above the minimum of 550 acres of nesting/roosting habitat (Table 13). Proposed treatments would occur in both the core and homerange of these activity centers (see Appendix D & E) for details of treatments by habitat type and acres.

Table 12. Four core areas (0.5 mile radius) that overlap with the proposed Somes Bar Integrated Fire Management Project.

AC (0.5 mile Core Area)	Foraging	Nesting/Roosting	Grand Total for NRF
1250	125	201	326
1073	85	271	356
58	125	269	394
53	150	150	300

Table 13. Ten home range areas (1.3 mile radius) that overlap with the proposed Somes Bar Integrated Fire Management Project.

AC (1.3 mile Home Range)	Foraging	Nesting/Roosting	Grand Total for NRF
1089	883	1228	2111
1250*	911	1330	2241
1076	784	1439	2223
1073*	699	1340	2039
1260	503	1762	2265
SIS 0111	498	1433	1931
4059	935	1473	2408
58*	717	1383	2100
53*	815	986	1801
52	659	1498	2157
* AC with Core Area (0.5 mile) in a Project Area			

Nest Groves in Project Area

There are two nest groves occurring in the project area, Activity Center 1250 in Ti Bar and Activity Center 53 in Donahue. Both of these nest groves are currently unoccupied by NSO.

The Ti Bar nest grove is 109 acres, and would have approximately 9 acres of roadside treatment with a manual prescription that would cut, pile and burn material ≤ 4 " DBH (See figure 3). USFS road 13N02 is ingress/egress for private property and the Ukonom lookout. Within the Ti-bar nest grove 100 acres would receive no treatment.

The Donahue nest grove is 107 acres, of this 107 acres 12 acres are proposed for treatment along the private property boundary (See figure 6). Within the Donahue nest grove 95 acres would remain untreated. The proposed manual prescription along private property would include cutting, piling, and burning material ≤ 4 " dbh.

Proposed treatment effects on the NSO Activity Centers within the Project Area

Ten NSO ACs were included in the action area. Four core areas and ten home range areas have proposed treatments within the territory. The following displays the effects of the treatments on the habitat within each ACs. The order presented below is from the northern most activity center with a core area in Ti Bar Project area to the southernmost activity center with a core area in the Donahue Project area.

AC 1250

The last year of northern spotted owls detected was during the 2016 surveys, and a single male detected on July 14th, 2016. The 2017 surveys did not detect any northern spotted owls in this activity center or from the associated call points.

Activity Center 1250 overlaps with the Ti Bar Project area and is deficient in nesting-roosting-foraging (NRF) habitat in the core area (0.5 mile radius), having a combined 326 acres of NRF, but is not deficient in the home range (1.3 mile radius) with a total of 2241 acres of NRF habitat. The project proposes to treat with commercial thinning 5 acres in foraging (F) habitat and 13 acres in non-NRF habitat of the core area. The project proposes to treat with commercial thin 26 acres in nesting/roosting (NR), 84 acres foraging habitat and 65 acres in non-NRF habitat of the home range. Fuels treatments are for 37 acres of F, 8 acres of NR and 33 acres of non-NRF habitats in the core area. In the home range, fuels treatments would occur in 71 acres F, 74 acres of NR and 92 acres of non-NRF habitats. There are 4 acres of high-quality nesting/roosting (HQNR). The proposed treatment prescription for unoccupied HQNR habitat would be cut, pile and burn material ≤ 4 inches and a low intensity underburn. (Figure 3).

For temporary and new construction of roads, there are no acres within the core area and no acres of F habitat in the home range that would be removed by road treatments. In NR habitat, no acres would be removed in the core area and 0.1 acres would be moved in the home range. For new and existing landings, no NRF habitat would be removed in the core area and 2.7 acres of F and 1.0 acres of NR would be removed in the home range over several small areas. See Appendix D for total acres and percentages of treatments within the core area and home range area.

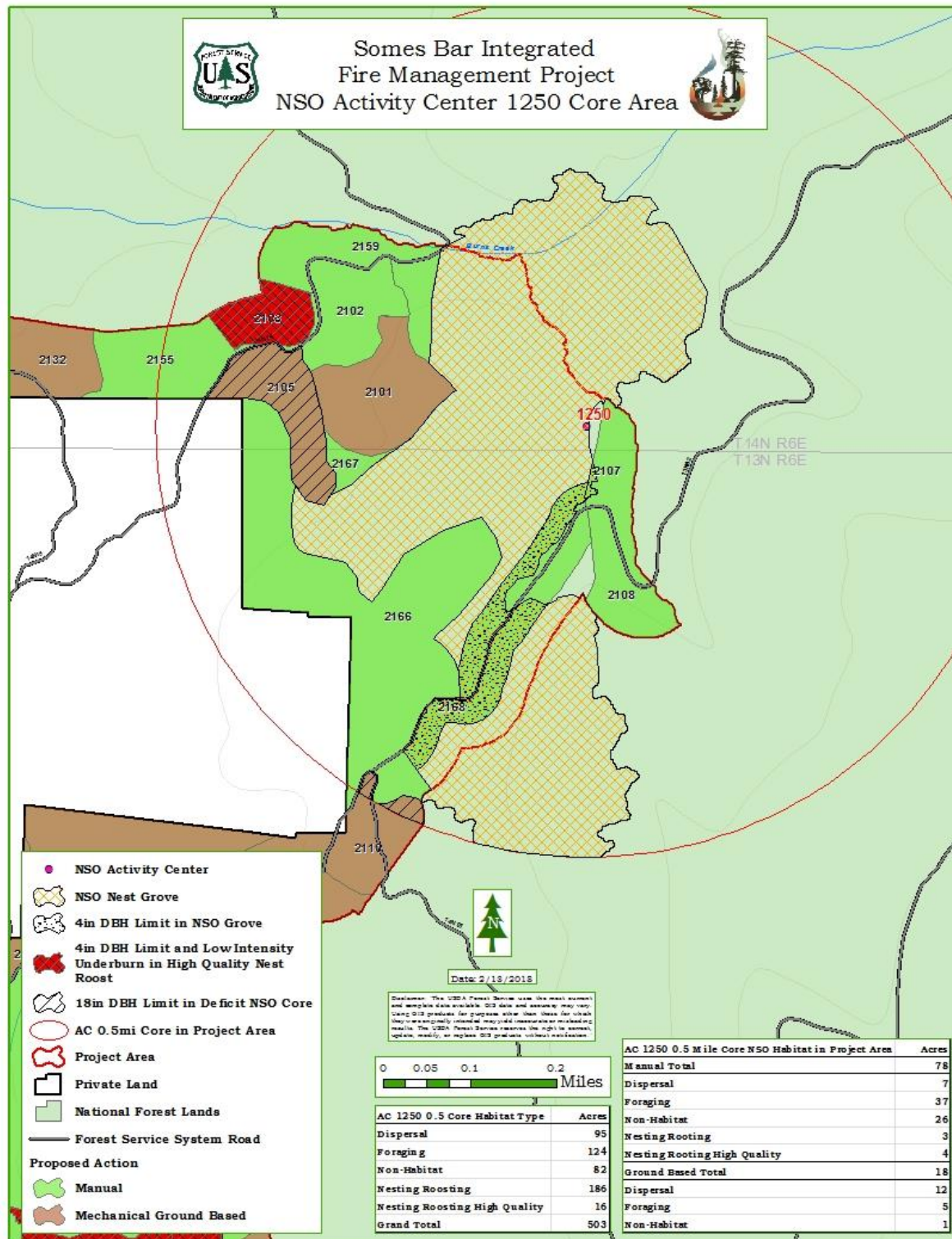


Figure 3. Map of Activity Center 1250 in the Ti Bar Project Area with location of NSO nest grove and mitigation measures.

AC 1073

The last year a northern spotted owl was detected was in 1992 surveys, and a single male was detected. The 2015 and 2016 surveys did not detect northern spotted owls during the two-year, six visit protocol surveys. The 2017 surveys did not detect any northern spotted owls in this activity center or associated call points during the three survey visits.

Activity Center 1073 is deficient in nesting-roosting-foraging (NRF) habitat in the core area (0.5 mile radius) having a combined 356 acres of NRF, but is not deficient in the home range (1.3 mile radius) with a total of 2039 acres of NRF habitat and overlaps with the Patterson Project area. The project proposes to treat with commercial thinning 4 acres in foraging (F) habitat, 1 acre in nesting/roosting (NR) and 8 acres in non-NRF habitat of the core area. This core area does contain HQNR habitat. The project proposes to treat with commercial thinning 8 acres in nesting/roosting, 21 acres foraging habitat and 97 acres in non-NRF habitat of the home range. Fuels treatments are for 5 acres of NR habitat in the core area. In the home range, fuels treatments would occur in 73 acres F, 50 acres of NR and 159 acres of non-NRF habitats (Figure 4).

For temporary and new construction of roads, there are 0.0 acres of F and 0.0 acres of NR within the core area and 0.1 acres of F habitat with 0.1 acre in NR habitat in the home range that would be removed by road treatments. For new and existing landings, no impacts would occur for NR and 0.1 acre in F habitat would be removed in the core area and 0.8 acres of F with no acres of NR would be removed in the home range. See Appendix D for total acres and percentages of treatments within the core area and home range area.

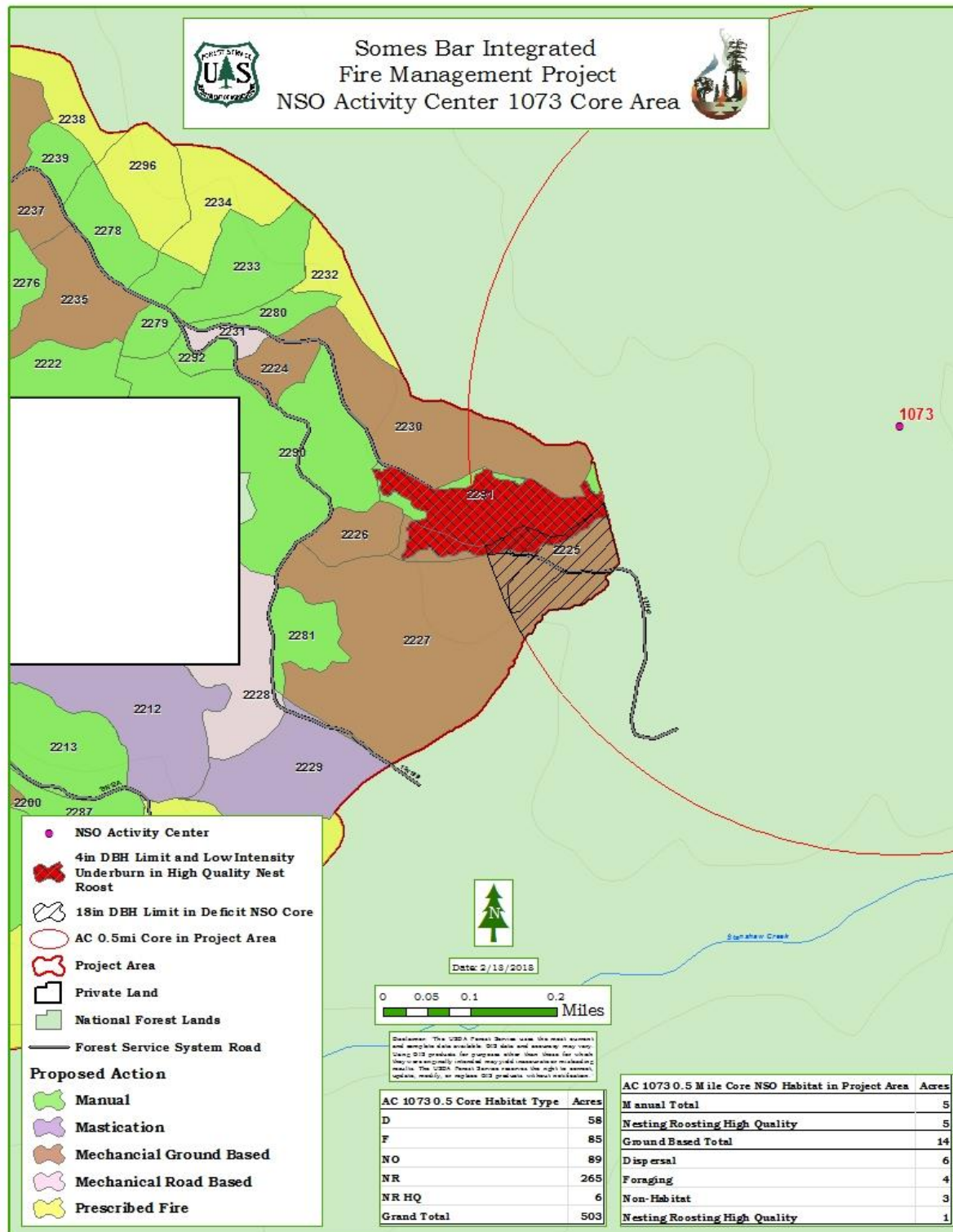


Figure 4. Map of Activity Center 1073 in the Patterson Project Area with location of NSO mitigation measures.

AC 58

The last year a northern spotted owl was detected was in 1995 when a single male was detected. The 2015 and 2016 surveys did not detect northern spotted owls during the two-year, six visit protocol surveys. The 2017 surveys did not detect any northern spotted owls in this activity center or associated call points during the three survey visits.

Activity Center 58 is deficient in nesting-roosting-foraging (NRF) habitat in the core area (0.5 mile radius) having a combined 392 acres of NRF, but is not deficient in the home range (1.3 mile radius) with a total of 2100 acres of NRF habitat and overlaps with the Donahue Project area. The project proposes to treat with commercial thinning 2 acres in foraging (F) habitat, 2 acres of NR and 15 acres in non-NRF habitat of the core area. The project proposes to treat with commercial thin 86 acres in nesting/roosting (NR), 100 acres foraging habitat and 200 acres in non-NRF habitat of the home range. Fuels treatments are for 12 acres of F, 42 acres of NR and 9 acres of non-NRF habitats in the core area. In the home range, fuels treatments would occur in 101 acres F, 261 acres of NR and 129 acres of non-NRF habitats (Figure 5).

For temporary and new construction of roads, there are no acres of NRF within the core area would be impacted, but the home range would have 0.6 acres of F and 0.8 acres of NR habitat removal from road treatments. For new and existing landings, no impacts would occur in the NRF habitat in the core area and in the home range there would be 1.2 acres of F and 1.3 acres of NR habitat removed. See Appendix D for total acres and percentages of treatments within the core area and home range area.

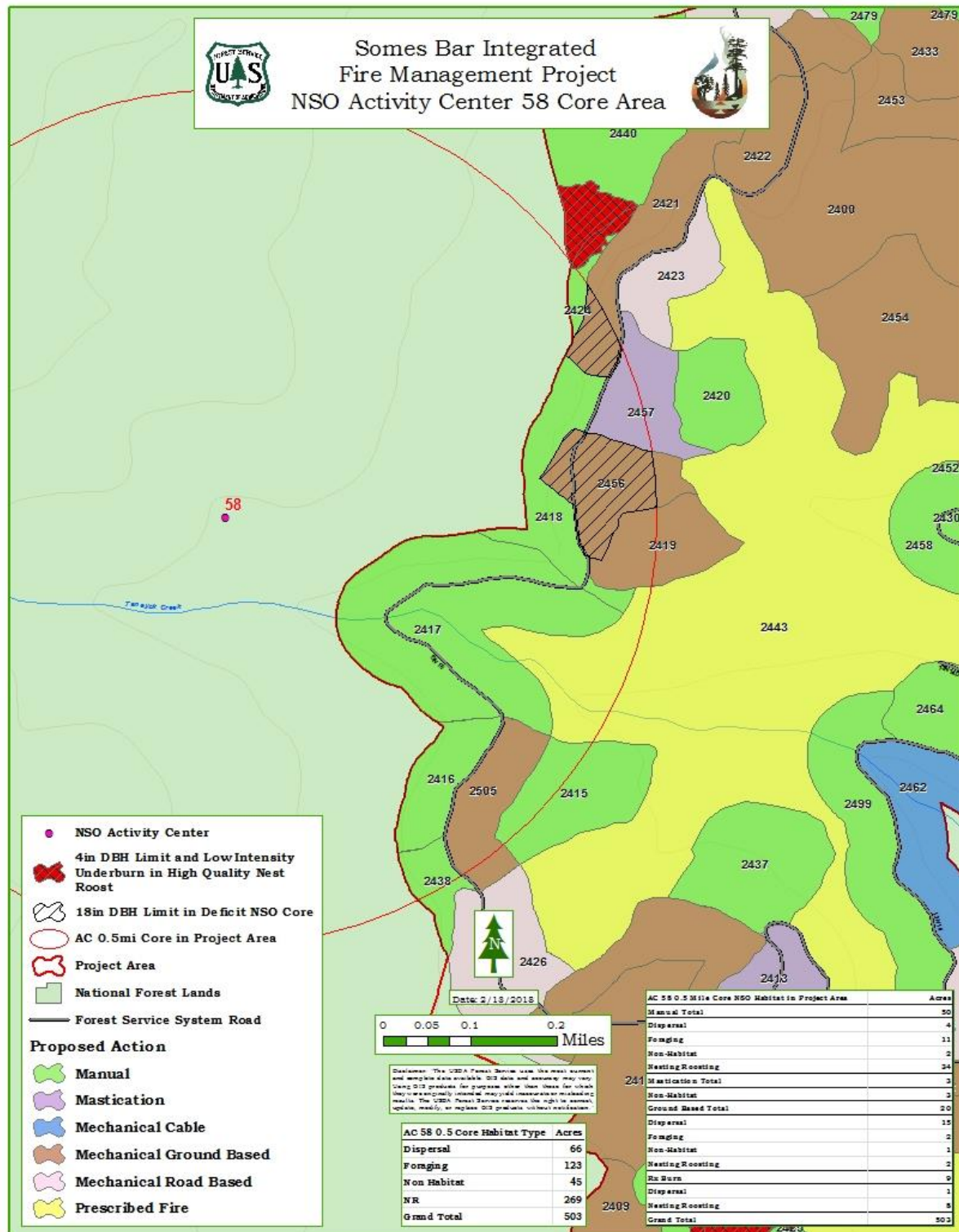


Figure 5. Map of Activity Center 58 in the Donahue Project Area with location of NSO mitigation measures.

AC 53

The last year a northern spotted owl was detected was in 2014 when a single male was detected. The 2015 and 2016 surveys did not detect northern spotted owls during the two-year, six visit protocol surveys. The 2017 surveys did not detect any northern spotted owls in this activity center or associated call points during the three survey visits.

Activity Center 53 is deficient in nesting-roosting-foraging (NRF) habitat in the core area (0.5 mile radius) having a combined 326 acres of NRF, but is not deficient in the home range (1.3 mile radius) with a total of 2241 acres of NRF habitat and overlaps with the Donahue Project area. The project proposes to treat with commercial thinning 5 acres in foraging (F) habitat and 13 acres in non-NRF habitat of the core area. The project proposes to treat with commercial thin 26 acres in nesting/roosting (NR), 84 acres foraging habitat and 65 acres in non-NRF habitat of the home range. Fuels treatments are for 37 acres of F, 8 acres of NR and 33 acres of non-NRF habitats in the core area. In the home range, fuels treatments would occur in 71 acres F, 74 acres of NR and 92 acres of non-NRF habitats. There are 4 acres of high-quality nesting/roosting (HQNR) habitat. The proposed treatment prescription for unoccupied HQNR habitat would be cut, pile and burn material ≤ 4 inches and/or a low intensity underburn (Figure 6).

For temporary and new construction of roads, there are no acres of NRF within the core area and no acres of NRF habitat in the home range that would be impacted by road treatments. For new and existing landings, no impacts would occur in the core area or home range for NRF habitats. See Appendix D for total acres and percentages of treatments within the core area and home range area.

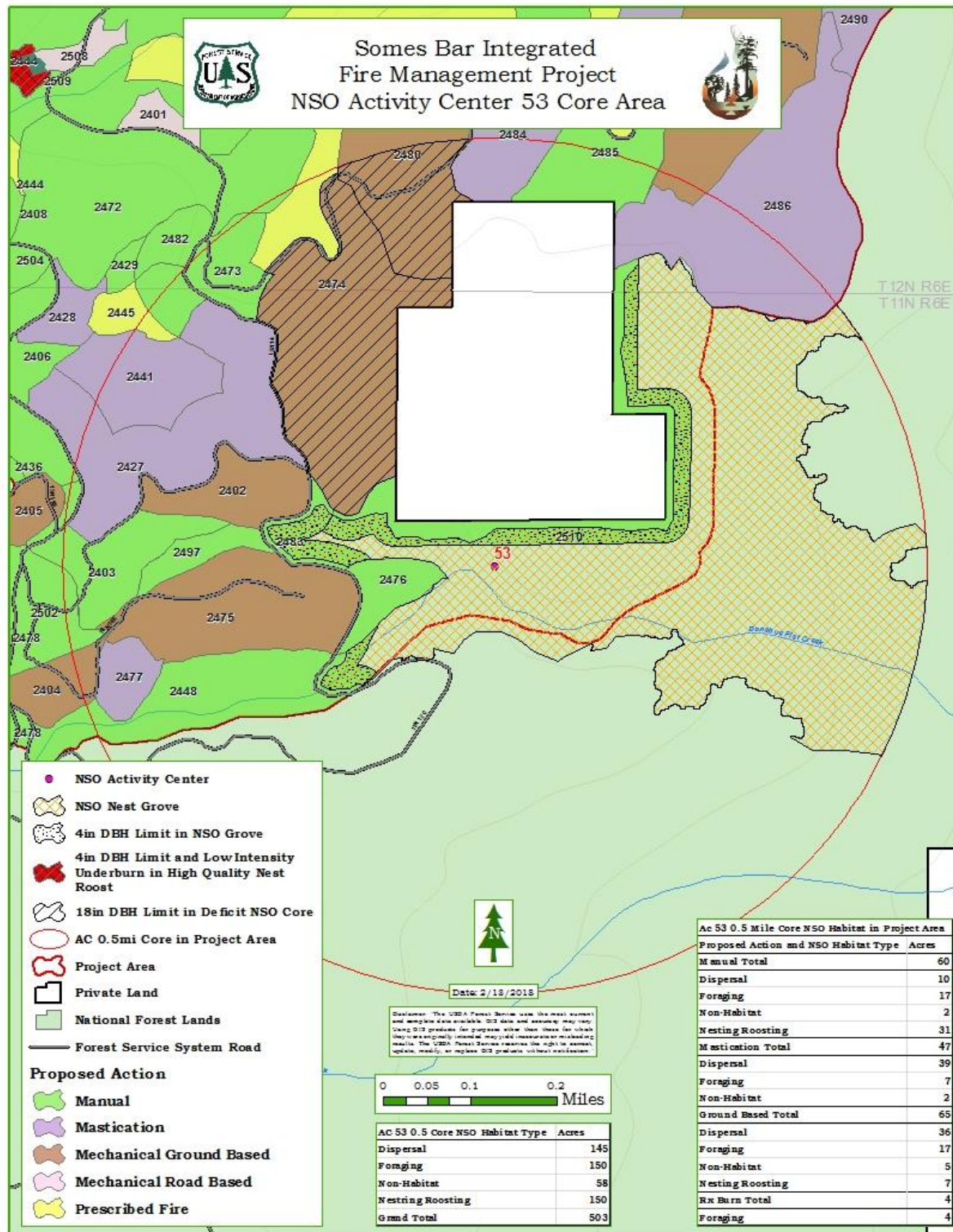


Figure 6. Map of Activity Center 53 in the Donahue Project Area with location of NSO nest grove and mitigation measures.

The remaining six ACs and Home Range analysis are reviewed below for ACs 1089, 1076, 1260, SIS0111, 4059, and 52, accounting that these six home ranges do not have core areas with in the

four project areas (Ti-Bar, Patterson, Rodgers, and Donahue). The order presented below is from the northern most activity center in Ti Bar Project area to the southernmost activity center in the Donahue Project area.

AC 1089

The last detection for northern spotted owls in activity center 1089 north of the Ti Bar Project area was 1996, when a pair was visually encountered. The 2015 and 2016 surveys did not detect northern spotted owls during the two-year, six visit protocol surveys. The 2017 surveys did not detect any northern spotted owls in this activity center or associated call points during the three survey visits.

Activity Center 1089 does not have the core area within the Ti Bar Project area footprint and has 21 acres total for treatments in the home range. The project proposes no commercial thinning in NRF habitat and 1 acre commercial thin in non-NRF habitat in the home range. In the home range, fuels treatments would occur in 3 acres F, 61 acres of NR and 2 acres if non-NRF habitats.

No temporary and new construction of roads would occur in the home range and no landing construction would occur in the home range. See Appendix E for total acres and percentages of treatments within the core area and home range area.

AC 1076

The last record detection of a northern spotted owl was by aural detection of a male in 2016 on July 14th at call point 92. It was not detected on follow-up visits or subsequent call routes, nor during the 2017 surveys.

Activity Center 1076 does not have the core area within the Ti Bar Project area footprint and has 75 acres total for treatments in the home range. The project proposes commercial thinning in 1 acres of F and 5 acres of NR habitat in the home range. In the home range, fuels treatments would occur in 3 acres F, 61 acres of NR and 2 acres if non-NRF habitats.

For temporary and new construction of roads, there are no acres of F and no acres of NR habitat in the home range that would be impacted by road treatments. For new and existing landings, 0.2 acres of NR would be impacted in the home range. See Appendix E for total acres and percentages of treatments within the core area and home range area.

AC 1260

Activity center 1260 had a 2016 record for a single male northern spotted owl detected by aurally on July 22nd, 2016 from call point 71, then again on August 8th, 2016 from call point 72. Follow up visits on the following day did not detect the owl. However, on September 15th, 2016, a male was detected from call point 72 and the follow up visit on September 16th, 2016 produced the male with two young. This detection record occurred in two home ranges, 1260 and SIS111, and late in the season, fledglings could be associated to either home range. The 2017 field surveys did not detect any northern spotted owls.

Activity Center 1260 does not have the core area within the Roger's Creek Project area footprint and has 290 acres total for treatments in the home range. The project proposes commercial thinning in 6 acres of F, 7 acres of NR habitat and in 4 acres of non-NRF habitat in the home range. In the home range, fuels treatments would occur in 102 acres F, 56 acres of NR and 115 acres if non-NRF habitats.

For temporary and new construction of roads, there are 0.1 acres of F and no acres of NR habitat in the home range that would be impacted by road treatments. For new and existing landings, no construction would occur in NRF habitats in the home range. See Appendix E for total acres and percentages of treatments within the core area and home range area.

AC SIS0111

Activity center SIS0111 had a 2016 record for a single male northern spotted owl detected by aurally on July 22nd, 2016 from call point 71, then again on August 8th, 2016 from call point 72. Follow up visits on the following day did not detect the owl. However, on September 15th, 2016, a male was detected from call point 72 and the follow up visit on September 16th, 2016 produced the male with two young. These records also reflect activity center SIS0111, and the fledglings are associated with that AC due to closer proximity. The 2017 field surveys did not detect any northern spotted owls.

Activity Center SIS0111 does not have the core area within the Roger's Creek Project area footprint and has 407 acres total for treatments in the home range, of which 258 acres are in NRF habitats. The project proposes no commercial thinning in NRF habitat and in 4 acres of non-NRF habitat in the home range. In the home range, fuels treatments would occur in 127 acres F, 131 acres of NR and 145 acres if non-NRF habitats.

For temporary and new construction of roads, there are no impacts to NRF habitat. For new and existing landings, no construction would occur in NRF habitats in the home range. See Appendix E for total acres and percentages of treatments within the core area and home range area.

AC 4059

Activity center 4059 had a previous 1996 record for a pair of northern spotted owls detected. The 2015 and 2016 surveys did not detect northern spotted owls during the two-year, six visit protocol surveys. The 2017 surveys did not detect any northern spotted owls in this activity center or associated call points during the three survey visits.

Activity Center 4059 does not have the core area within the Roger's Creek Project area footprint and has 142 acres total for treatments in the home range, of which 80 acres are in NRF habitats. The project proposes commercial thinning in 4 acres of F habitat and in 11 acres of non-NRF habitat in the home range, with no commercial treatments in NR habitat. In the home range, fuels treatments would occur in 45 acres F, 31 acres of NR and 51 acres if non-NRF habitats.

For temporary and new construction of roads, there are no impacts to NR habitat and 0.1 acres of F habitat in the home range impacted by road construction. For new and existing landings, no construction would occur in NRF habitats in the home range. See Appendix E for total acres and percentages of treatments within the core area and home range area.

AC 52

Activity center 52 had a previous 2014 record for a male northern spotted owl detected on June 10th of that year. Follow-up visits failed to detect the individual again. The 2015 and 2016 surveys did not detect northern spotted owls during the two-year, six visit protocol surveys associated with this activity center. The 2017 surveys did not detect any northern spotted owls in this activity center or associated call points during the three survey visits.

Activity Center 52 does not have the core area within the Roger's Creek Project area footprint and has 142 acres total for treatments in the home range, of which 80 acres are in NRF habitats. The project proposes commercial thinning in 4 acres of F habitat and in 11 acres of non-NRF habitat in the home range, with no commercial treatments in NR habitat. In the home range, fuels treatments would occur in 45 acres F, 31 acres of NR and 51 acres of non-NRF habitats.

For temporary and new construction of roads, there are no impacts to NRF habitat. For new and existing landings, no construction would occur in NRF habitats in the home range. See Appendix E for total acres and percentages of treatments within the core area and home range area.

Northern spotted owl surveys for the project, 2015-2016

Methods and results for northern spotted owl (SPOW) surveys

Surveys for NSO consisted of:

- In 2015 and 2016 - Biologists conducted a total of 6 nighttime survey passes across the CP network between 3/19/2015 and 9/1/2015, and from 4/14/2016 to 9/26/2016. Survey methodology protocol: (1) At daytime stand searches of historical activity centers (ACs); (2) nighttime broadcast surveys at previously established call points (a total of 127 CPs); and (3) follow-up daytime stand searches around nocturnal detection locations of SPOW or unidentified *Strix* owls (STUN). The CP network is intended to provide complete broadcast and listening coverage of the four SPOW survey areas.
- In 2017 - In 2017, the "spot check" surveys occurred from 5/1/2017 to 7/18/2017 for three nighttime broadcast surveys (a total of 47 CPs), follow-up daytime surveys and ACs surveys. All surveys have followed and would continue to follow, the current U.S. Fish and Wildlife Service survey protocol for SPOW (USFWS 2012).

Survey Strategy in the future program years 2019-2033.

The proposed survey strategy for the Somes Bar Integrated Fire Management Project would be two years of six night surveys out to 1.3 miles (2015 and 2016) and one daytime activity center search. This would be followed by four years of spot check surveys including three night surveys out to .25

miles (2017-2020) and one daytime activity center search. This pattern would continue for the life of the project.

Results

Surveyors detected SPOW on 10 occasions in 2015 (Table 14). All SPOW detected were male or unknown sex. AC 385 could be classified as occupied by a resident single male, see USFWS 2012). Otherwise, survey results in 2015 were insufficient for determining the occupancy and breeding status of detected SPOW (USFWS 2012). Six of the 2015 SPOW detections were located within 1.3 miles of historical ACs and three were not associated with known ACs (Table 14). Except for a late-season nocturnal detection of a male near CP 7 in Ti Bar, all SPOW detections were located outside the boundaries of the four project areas.

In 2016, surveyors detected SPOW on 9 occasions, or ‘events’ (Table 14). Some of these events involved multiple detections, as recorded on the data forms by surveyors. All adult SPOW detected were determined to be male. SPOW reproduction was confirmed at one site within the Roger’s Creek drainage, as evidenced by an adult male feeding two young owlets. At least four SPOW detections occurred within the boundaries of the Roger’s Creek WKRP project area.

The 2017 field season failed to detect any SPOW in the third year of surveys in the reduced call point route of the four project areas (Table 14).

Table 14. Northern Spotted Owl (*Strix occidentalis caurina*) detections for survey years 2015-2017 in the four Project Areas of the Somes Bar Integrated Fire Management Project.

Survey Area	Date	Sex	Age	How Detected	AC/CP
Donahue	4/17/2015	Male	Adult	Both (AC visit)	385
Donahue	5/14/2015	Male	Adult	Both (AC visit)	385
Donahue	7/22/2015	Male	Unk	Auditory	CP 105
Rogers Creek	8/8/2015	Unk	Unk	Auditory	CP 72
Rogers Creek	8/9/2015	Unk	Adult	Both (follow up)	SIS0111
Ti Bar	7/2/2015	Male	Unk	Auditory	CP 29
Ti Bar	8/13/2015	Unk	Unk	Auditory	CP 92
Ti Bar	8/24/2015	Male	Unk	Auditory	CP 7
Ti Bar	8/25/2015	Male	Unk	Auditory	CP 97
Ti Bar	9/1/2015	Male	Unk	Auditory	CP 24
Donahue	4/7/2016	Male	Unk	Auditory	4060
Patterson	4/29/2016	Male	Adult	Auditory	CP 58
Rogers Creek	6/10/2016	Male	Unk	Auditory	CP 75
Rogers Creek	6/10/2016	Male	Unk	Auditory	CP 78
Rogers Creek	7/22/2016	Male	Adult	Auditory	CP 71
Rogers Creek	8/1/2016	Male	Adult	Auditory	CP 72
Rogers Creek	9/15/2016	Male	Adult	Auditory	CP 72
Rogers Creek	9/16/2016	Reproductive Pair	Adult Male with Young	Both (follow up)	CP 71
Ti Bar	7/14/2016	Male	Unk	Auditory	CP 92
Ti Bar & Patterson	5/1/2017	No Detections			
Rogers Creek and Donahue	5/2/2017	No Detections			
Ti Bar & Patterson	5/23/2017	No Detections			
Rogers Creek and Donahue	5/24/2017	No Detections			
Ti Bar & Patterson	7/17/2017	No Detections			
Rogers Creek and Donahue	7/18/2017	No Detections			

The 2015 survey crew detected unknown-sex STUN on 6 occasions (Table 15). Surveyors detected BDOW on at least 39 occasions (Table 16). Three of the BDOW detections were of pairs, so a maximum total of 42 individuals were detected. Other than the 3 females detected as members of pairs, all other BDOW detected were male or unknown sex.

The 2016 survey crew detected STUN on four occasions (Table 15). Surveyors recorded 53 BDOW detections, including 5 pairs (Table 16). All other BDOW detections were of males or unknown sex.

In the 2017 surveys, no STUN were detected and BDOW were detected on three occasions.

Table 15. 2015 detections of unidentified *Strix* owls (northern spotted owls or barred owls that were not identified to species) in Somes Bar Integrated Fire Management Project northern spotted owl survey areas.

Survey Area	Date	Sex	Age	How Detected	Call Point
Rogers Creek	4/30/2015	Unk	Unk	Auditory	86
Patterson	3/19/2015	Unk	Unk	Visual	AC visit (1073)
Patterson	3/26/2015	Unk	Unk	Visual	51
Patterson	4/24/2015	Unk	Unk	Visual	49
Ti Bar	5/7/2015	Unk	Unk	Visual	28
Ti Bar	5/29/2015	Unk	Unk	Visual	21
Donahue	4/14/2016	Unk	Unk	Auditory	121
Donahue	6/24/2016	Unk	Unk	Auditory	103
Rogers Creek	7/22/2016	Unk	Unk	Auditory	86
Ti Bar	7/29/2016	Adult	Female	Auditory	10

No *Strix* unknown detected in 2017 surveys

Table 16. Barred Owl (*Strix varia*) detections for survey years 2015-2017 in the four Project Areas of the Somes Bar Integrated Fire Management Project.

Survey Area	Date	Sex	Age	How Detected	AC/CP
Donahue	5/14/2015	Male	Unk	Auditory	98
Donahue	5/15/2015	Male	Unk	Auditory	119
Rogers Creek	5/1/2015	Unk	Unk	Auditory	86
Rogers Creek	5/29/2015	Male	Unk	Auditory	79
Rogers Creek	6/25/2015	Male	Adult	Both	72
Rogers Creek	6/25/2015	Unk	Unk	Auditory	62
Rogers Creek	6/26/2015	Unk	Unk	Auditory	74
Rogers Creek	7/30/2015	Unk	Unk	Auditory	80
Rogers Creek	8/25/2015	Male	Unk	Auditory	76
Rogers Creek	8/26/2015	Unk	Unk	Auditory	59

Survey Area	Date	Sex	Age	How Detected	AC/CP
Patterson	3/25/2015	Male	Unk	Auditory	41
Patterson	3/25/2015	Male	Adult	Both	AC visit
Patterson	5/21/2015	Male	Unk	Auditory	127
Patterson	5/21/2015	Unk	Unk	Not reported	38
Patterson	5/21/2015	Unk	Unk	Auditory	40
Patterson	5/30/2015	Male	Unk	Auditory	127
Patterson	6/18/2015	Unk	Unk	Auditory	40
Patterson	7/16/2015	Unk	Unk	Visual	45
Patterson	7/16/2015	Unk	Unk	Auditory	57
Patterson	7/17/2015	Unk	Unk	Auditory	54
Patterson	8/4/2015	Unk	Unk	Auditory	51
Patterson	8/4/2015	Unk	Unk	Auditory	58
Patterson	8/4/2015	Unk	Unk	Auditory	50
Patterson	8/5/2015	Unk	Unk	Auditory	54
Patterson	8/6/2015	Male	Adult	Both	44
Patterson	8/28/2015	Male	Unk	Auditory	127
Ti Bar	5/7/2015	Male	Unk	Auditory	12
Ti Bar	5/7/2015	Unk	Unk	Auditory	85
Ti Bar	5/9/2015	Male	Unk	Auditory	Follow up
Ti Bar	5/29/2015	Male	Unk	Both	129
Ti Bar	5/29/2015	Female	Unk	Both	129
Ti Bar	6/4/2015	Unk	Unk	Auditory	23
Ti Bar	6/4/2015	Unk	Unk	Auditory	85
Ti Bar	6/5/2015	Unk	Unk	Visual	28
Ti Bar	7/2/2015	Male	Unk	Both	19
Ti Bar	7/2/2015	Female	Unk	Both	19
Ti Bar	7/4/2015	Male	Unk	Auditory	29
Ti Bar	8/13/2015	Unk	Unk	Auditory	22
Ti Bar	8/14/2015	Unk	Unk	Auditory	129
Ti Bar	8/25/2015	Male	Adult	Both	11
Ti Bar	8/25/2015	Female	Adult	Both	11
Ti Bar	9/1/2015	Male	Adult	Both	11
Ti Bar	4/28/2016	Unk	Unk	Visual	129
Ti Bar	4/28/2016	Male	Adult	Auditory	25
Ti Bar	4/28/2016	Male	Unk	Auditory	23
Ti Bar	4/28/2016	Unk	Unk	Auditory	28
Ti Bar	4/28/2016	Female	Adult	Both	19
Ti Bar	4/28/2016	Male	Adult	Both	19

Survey Area	Date	Sex	Age	How Detected	AC/CP
Ti Bar	5/19/2016	Female	Adult	Both	19
Ti Bar	5/19/2016	Male	Adult	Both	19
Ti Bar	5/19/2016	Male	Adult	Both	18
Ti Bar	6/29/2016	Unk	Unk	Visual	27
Ti Bar	7/13/2016	Male	Adult	Auditory	8
Ti Bar	7/13/2016	Unk	Unk	Both	13
Ti Bar	7/13/2016	Unk	Unk	Auditory	18
Ti Bar	7/13/2016	Unk	Unk	Auditory	19
Ti Bar	7/13/2016	Unk	Juvenile	Both	19
Ti Bar	7/13/2016	Unk	Juvenile	Both	19
Ti Bar	7/29/2016	Unk	Juvenile	Auditory	11
Ti Bar	7/29/2016	Male	Adult	Auditory	13
Ti Bar	9/19/2016	Unk	Unk	Auditory	92
Ti Bar	9/19/2016	Unk	Unk	Auditory	92
Ti Bar	9/19/2016	Unk	Unk	Auditory	10
Rogers Creek	4/20/2016	Unk	Unk	Auditory	80
Rogers Creek	7/22/2016	Male	Adult	Auditory	74
Patterson	4/20/2016	Unk	Unk	Visual	49
Patterson	4/29/2016	Female	Adult	Both	42
Patterson	4/29/2016	Male	Adult	Both	42
Patterson	4/29/2016	Male	Adult	Auditory	40
Patterson	5/18/2016	Male	Adult	Auditory	127
Patterson	5/18/2016	Female	Adult	Auditory	127
Patterson	5/18/2016	Unk	Unk	Both	52
Patterson	6/15/2016	Unk	Unk	Not Listed	58
Patterson	7/2/2016	Unk	Adult	Visual	44
Patterson	7/14/2016	Unk	Unk	Visual	127
Patterson	7/16/2016	Female	Adult	Both	57
Patterson	7/16/2016	Male	Adult	Both	57
Patterson	7/16/2016	Male	Adult	Auditory	56
Donahue	4/8/2016	Female	Adult	Auditory	AC 81
Donahue	4/8/2016	Male	Adult	Auditory	AC 81
Donahue	4/8/2016	Male	Adult	Auditory	AC 81
Donahue	5/6/2016	Unk	Unk	Auditory	93
Donahue	5/6/2016	Unk	Unk	Auditory	113
Donahue	5/6/2016	Unk	Unk	Auditory	121
Donahue	5/6/2016	Male	Adult	Auditory	117
Donahue	6/23/2016	Male	Adult	Auditory	119

Survey Area	Date	Sex	Age	How Detected	AC/CP
Donahue	6/25/2016	Male	Adult	Auditory	103
Donahue	7/23/2016	Male	Adult	Auditory	113
Donahue	8/11/2016	Unk	Unk	Auditory	93
Donahue	8/12/2016	Unk	Unk	Not Listed	122
Ti Bar	5/1/2017	Unk	Adult	Both	AC 1250
Ti Bar	5/23/2017	Unk	Adult	Auditory	18
Patterson	5/23/2017	Unk	Adult	Both	47

The last known detection records for each activity center reviewed for the Somes Bar Integrated Fire Management Project are reported in Table 17 and updated through 2017 surveys.

Table 17. Last known detection records for ten Activity Centers in the Somes Bar Integrated Fire Management Project.

SPOW Activity Center No.	Site Name	Date	SPOW Detection(s)
1089		1996	Pair
1250		2016	Male
1076		2016	Male
1073		1992	Male
1260		2016	Male
SIS 111		2016	Male +2 young
4059		1996	Pair
58	Scorpion	1995	Male
53	Donahue Flat	2014	Pair
52	Wilder Creek	2014	Male

NSO Critical Habitat

Primary Constituent Elements (PCEs) are the physical and biological features that provide the essential life history requirements of the species. The 2011 CHU designation identifies the primary constituent elements for NSO as those physical and biological features that support nesting, roosting, foraging, and dispersal. Specifically the PCEs for the NSO are summarized (from USDI Fish and Wildlife Service 2012):

1. Forest types that support the northern spotted owl across its geographic range. Within the California Coastal Range (Klamath West), these include mixed conifer/mixed conifer-hardwood, mixed evergreen, Douglas-fir, white fir, and Shasta red fir. These forest types may be in early-, mid- or late-seral stages.
2. Nesting, roosting, and
3. Foraging habitat, and

4. Dispersal habitat.

These PCEs are quoted from the critical habitat rule. In the following analysis, we will refer to these PCE categories as PCEs 1, 2, 3 and 4 with subdivisions discussed as appropriate. This document only evaluates project effects in relation to the 2012 critical habitat ruling and supersedes, as appropriate, any previous analysis of critical habitat effects.

PCE 1, Forest Type:

These activities can occur in early-, mid-, or late-seral forest types identified in the PCEs in the final rule. On the Forest, PCE 1 includes the mixed conifer and mixed evergreen type, the Douglas-fir type, the Shasta red fir type and a small amount of the moist end of the ponderosa pine, coniferous forest zones.

PCE 2, Nesting and Roosting habitat California Coast Range (Klamath West)

Stands for nesting and roosting that are generally characterized by:

- a) moderate to high canopy closure (60 to over 80 percent);
- b) Multilayered, multispecies canopies with large (20 to 30 inches or greater dbh) overstory trees;
- c) High basal area (greater than 240 square feet/acre);
- d) High diversity of different diameters of trees;
- e) High incidence of large live trees with various deformities (e.g., large cavities, broken tops, mistletoe infections, and other evidence of decadence);
- f) Large snags and large accumulations of fallen trees and other woody debris on the ground; and
- g) Sufficient open space below the canopy for northern spotted owls to fly.

PCE 3, Foraging habitat in the California Coast Range (Klamath West)

Foraging habitat is generally characterized by:

- a) Stands of nesting and roosting habitat; in addition, other forest types with mature and old-forest characteristics;
- b) Presence of the conifer species, incense-cedar, sugar pine, Douglas-fir, and hardwood species such as big leaf maple, black oak, live oaks, and madrone, as well as shrubs;
- c) Forest patches within riparian zones of low-order streams and edges between conifer and hardwood forest stands;
- d) Brushy openings and dense young stands or low-density forest patches within a mosaic of mature and older forest habitat;
- e) High canopy cover (87 percent at frequently used sites);
- f) Multiple canopy layers;

- g) Mean stand diameter greater than 21 inches;
- h) Increasing mean stand diameter and densities of trees greater than 26 inches increases foraging habitat quality;
- i) Large accumulations of fallen trees and other woody debris on the ground; and
- j) Sufficient open space below the canopy for northern spotted owls to fly.

PCE 4, Dispersal (also-known-as “transience and colonization”) habitat in the California Coast Range (Klamath West)

Dispersal habitat is generally characterized by:

- a) Stands with adequate tree size and canopy cover to provide protection from avian predators and minimal foraging opportunities; in general this may include, but is not limited to, trees with at least 11 inches dbh and a minimum 40 percent canopy cover; and
- b) Younger and less diverse forest stands than foraging habitat, such as even-aged, pole-sized stands, if such stands contain some roosting structures and foraging habitat to allow for temporary resting and feeding during the transience phase.
- c) Habitat supporting the colonization phase of dispersal, which is generally equivalent to nesting, roosting, and foraging habitat as described in PCEs (2) and (3), but may be smaller in area than that needed to support nesting pairs.

The Klamath LRMP (1994), Six Rivers LRMP (1995) and the USFWS (2009) defines nesting/roosting habitat as having a minimum of 60% canopy cover. As recommended by the 2011 NSP RP and 2012 CH Rule, the Level 1 Team used local knowledge of NSO habitat use to develop the definitions of foraging and dispersal habitat. The minimum required percent canopy cover for both foraging and dispersal habitat is 40%.

NSO Critical Habitat in the Somes Bar Integrated Fire Management Project

The proposed project would affect PCEs 2, 3, and 4. Nesting/roosting, foraging and dispersal habitat types would be both removed and modified by proposed activities. Effects expected to occur from each treatment type are described above in the Effects to NSO habitat discussion.

The action area is located within Critical Habitat Unit 9 and two subunits: K LW6, and K LW7. These subunits were established to function as NSO demographic support (USDI 2012 page 71933); resource agencies are encouraged to work toward maintaining or enhancing the characteristics of older forest and providing large habitat blocks and associated forest conditions. Regional variations should be taken into account; in the California Coast Range (Klamath West) this means providing mosaics of interior habitats and edges to provide for diversity of prey. Management activities that contribute to recovery goals through the removal of ground, ladder fuels and the restoration of ecosystem processes that lead to the development or replacement of spotted owl habitat, are recommended. The current number of acres for PCEs 2, 3, and 4 are

presented in the following tables. The proportion of habitat within each subunit that is affected by the proposed activities is described in the following table (see table 18).

Table 18: Current number of Critical Habitat Acres within the Somes Bar Integrated Fire Management Project				
Critical Habitat Subunit	Critical Habitat Acres in Action Area	NSO habitat types		
		Nesting/Roosting	Foraging	Dispersal
KLW6	2,867	1,495	470	532
KLW7	34,580	12,662	8,679	6,013
Grand Total	37,447	14,157	9,149	6,545

Note that all Primary Constituent Elements (PCE) discussed below occur in concert with PCE 1, which is coniferous forest types that support the NSO.

Nesting/Roosting Habitat (PCE 2)

Suitable N/R spotted owl habitat, as defined by the Forest Service, is composed of mature timbered stands having multi-layered conditions, a canopy closure of 60% or greater, and obvious decadence (large, live coniferous trees with deformities such as cavities, broken tops, and dwarf-mistletoe infections). Overstory should be comprised of conifer trees 21 inches or greater dbh and should comprise at least 40% of the total canopy closure. The Forest's local definition of N/R habitat also includes stands with overstory canopy closure of at least 40% because these stands typically have a hardwood understory which increases total canopy closure to 60% or greater.

Potential treatment units were selected by a silviculturalist from a vegetative data base and then field verified as to density and stand structure. Field verification was completed by the silviculturalist and wildlife biologist. Mid-mature stands with predominant trees were ground verified as to whether they contained stand structure characteristics that would be classified as high quality nesting roosting habitat.

Of the 37, 447 acres of critical habitat within the Action Area, 14,157 acres are suitable N/R habitat, and 1,241 acres of suitable N/R habitat are proposed for treatment (see Table 19). Approximately 154 acres of N/R habitat is proposed for commercial thinning (ground based, road based, cable units), 683 acres of N/R habitat is proposed for fuels reduction treatments (manual Rx and mastication), and 404 acres of N/R habitat is proposed for Underburn treatments. These proposed treatments would accelerate the development of late-successional characteristics that favor northern spotted owls and protect existing suitable habitat.

The two nest groves (ACs53, and ACs1250) and high quality nesting/roosting habitat polygons (mid-mature stands with mature forest characteristics and all mature and old growth) were dropped from commercial treatment.

Table 19: Summaries of habitat treatment within the PCEs (2-4) of critical habitat subunits.			
Habitat Type	Acres of Critical Habitat in Action Area by NSO Habitat Type	Acres of Critical Habitat in Action Area proposed for Treatment	Percent of Habitat Treated by NSO Habitat Type
Dispersal	6,545	977	15%
Foraging	9,150	1,336	15%
Nesting/Roosting	14,157	1,241	9%
Non-habitat	7,595	816	11%
Grand Total	37,447	4,370	12%

There would be no downgrade or removal of N/R habitat due to commercial, or fuels reduction activities. Habitat removal would occur during road and landing construction see roads and landings below.

Fuels reduction activities may modify suitable NSO N/R PCE; however, but the habitat would remain suitable post-implementation.

- Treatments would occur within 150 feet of private property or along ingress or egress roads within a nest grove. Proposed Vegetation treatment is limited to understory shrubs and small diameter trees 4" dbh or less. Pruning of remaining trees (10-12 ft. up from the ground) may also occur within 50 ft. of the road. The proposed treatment would modify but maintain NR habitat.
- Low intensity understory burning and $\leq 4"$ cut, pile and burn is proposed in unoccupied, HQNR habitat polygons. The proposed treatment would modify but maintain HQNR habitat.
- Roadside fuelbreaks and Ingress/Egress fuelbreaks (300 feet each side of the road) would retain approximately 30 percent of uncut understory vegetation to provide cover for other wildlife species. Leave about 30 percent of existing understory vegetation in a mosaic pattern that feathers more leave patches in the latter half (150 feet to 300 feet) of the fuelbreak (See Appendix B for more detail of prescriptions). The proposed treatment would modify but maintain NR habitat.
- Shaded fuelbreak construction may occur in suitable TES habitat. No overstory trees or overstory canopy would be removed; however, in areas where the existing overstory canopy closure is low (but greater than 40%) treatments in secondary or understory canopy layers should maintain a minimum overall canopy closure of 60 percent. The proposed treatment would modify but maintain NR habitat.

Fuel treatments are designed to reduce the risk of fire disturbance on a large scale. Although multi-layered conditions contributing to N/R PCEs would be slightly reduced by removing brush and understory trees (4"-8" dbh or less) within 50-300 ft. of a road, treatments would result in a greater assurance of long-term maintenance of existing late-successional habitat within the action area. Fuel treatments in strategic areas along high-use roads would reduce the risk of fire ignitions along

high use roads and provide greater protection to adjacent late-successional habitat. This will protect and enhance owl Critical Habitat in the long run.

Temporary road construction totaling 0.6 miles and landing construction (30 new landings) would remove small areas of N/R habitat in the project area. These areas will be scattered across the project area, represent small forest openings, and will be areas approximately .25-.75 acres in size. A total of 3.3 acres of NR would be removed during implementation of the project (See table 20). All temporary roads and associated landings will be decommissioned after project activities are complete.

Table 20: Temporary road and landing construction in NSO Critical Habitat			
Alternative	NSO Critical Habitat Removed by Habitat Type		
	Nesting/roosting (ac)	Foraging (ac)	Dispersal (ac)
Alternative 2	-3.3	-5.9	-58

The 1,241 acres of PCE2 proposed for treatment represents 9% of the available suitable PCE2 in the project area (See table 18). In the proposed action 154 acres of Nesting/roosting habitat is proposed for commercial/mechanical treatment this represents $\leq 1\%$ of this habitat type proposed for treatment. The majority of the PCE2 proposed for treatment would be fuels treatments (manual prescribed fire, and underburning) which would represent 8% of the proposed treatments. The fuels treatments would occur over a period of 15 years reducing short-term effects for this habitat type within critical habitat. Even though the proposed treatment areas will remain suitable immediately post-treatment, 12,815 acres (91%) of suitable N/R habitat in the action area will remain untreated.

Foraging Habitat (PCE 3)

The 2012 Critical Habitat Rule describes foraging habitat in the Klamath and Northern California Interior Coast Ranges Zone as having “very vegetative diversity” and that foraging-only habitat “for this zone showed greater divergence from nesting habitat, with much lower canopy cover and tree size.” The Rule states that “habitats used for foraging northern spotted owls are much more variable than in northern portions of the species’ range” and that “northern spotted owls will forage in younger stands and brushy openings with high prey densities and access to prey (Carey et al. 1992; Rosenberg and Anthony 1992; Thome et al. 1999; Irwin et al. 2012). Throughout much of the owl’s range, the same habitat that provides for nesting and roosting also provides for foraging, although northern spotted owls have greater flexibility in utilizing a variety of habitats for foraging than they do for nesting and roosting.”

Foraging habitat often has attributes similar to that of nesting and roosting habitat, but such habitat lacks specific nesting structures necessary to support successfully nesting pairs. It is often the younger stands that provide habitat for those early and mid-successional associated prey species that N/R does not offer. Foraging habitat is identified in the SRNF vegetation GIS layer, which uses the 11 inch dbh/40% canopy closure of the California Wildlife Habitat Relationship (CWHR) classification to define the lower end of this habitat type. Due to this many acres of conifer dominated stands are shown here as foraging habitat rather than as dispersal habitat.

Of the 37,447 acres of critical habitat within the Action Area, 9,150 acres are suitable foraging habitat, and 1,336 acres of suitable foraging habitat are proposed for treatment (Table 19). Approximately 328 acres of foraging habitat is proposed for commercial thinning (ground based, road based, cable units), 644 acres of foraging habitat is proposed for fuels reduction treatments (manual Rx and mastication), and 364 acres of foraging habitat is proposed for Underburn treatments. These proposed treatments will accelerate the development of late-successional characteristics that favor northern spotted owls and protect existing suitable habitat.

There would be no downgrade or removal of foraging habitat due to commercial, or fuels reduction activities. Habitat removal would occur during road and landing construction see roads and landings below.

Fuels reduction activities may modify suitable NSO foraging PCE3; however, but the treated habitat would remain suitable post-implementation.

- Roadside fuelbreaks and Ingress/Egress fuelbreaks (300 feet each side of the road) would retain approximately 30 percent of uncut understory vegetation to provide cover for other wildlife species. Leave about 30 percent of existing understory vegetation in a mosaic pattern that features more leave patches in the latter half (150 feet to 300 feet) of the fuelbreak (See Appendix B for more detail of prescriptions). The proposed treatment would modify but maintain foraging habitat.
- Shaded fuelbreak construction may occur in suitable TES habitat. No overstory trees or overstory canopy would be removed; however, in areas where the existing overstory canopy closure is low (but greater than 40%) treatments in secondary or understory canopy layers should maintain a minimum overall canopy closure of 60 percent. The proposed treatment would modify but maintain foraging habitat.

Fuel treatments are designed to reduce the risk of fire disturbance on a large scale. Although multi-layered conditions contributing to foraging PCEs would be slightly reduced by removing brush and understory trees (4"-8" dbh or less) within 50-300 ft. of a road, treatments would result in a greater assurance of long-term maintenance of existing late-successional habitat within the action area. Fuel treatments in strategic areas along high-use roads would reduce the risk of fire ignitions along high use roads and provide greater protection to adjacent late-successional habitat. This will protect and enhance owl Critical Habitat in the long run.

Temporary road construction totaling 0.6 miles and landing construction (30 new landings) will remove Foraging habitat in the project area. These areas will be scattered across the project area, represent small forest openings, and will be areas approximately .25 acres in size. A total of 5.9 acres of F would be removed during implementation of the project (See table 20). All temporary roads and associated landings will be decommissioned after project activities are complete.

Removal of PCEs for temporary road and landing construction will be minimal in any one area. No PCEs will be removed through commercial thinning or fuels treatments. The project design would ensure retention of existing stand structure, species composition, snags, and downed logs. Canopy closure will be reduced in the short term, but will be maintained at a minimum of 40%

closure. Foraging habitat function will be maintained immediately post-project. Treatment will maintain functional PCE conditions within all currently suitable foraging habitats and is expected to improve conditions within the stands treated in the long term. These treatments will accelerate the development of late-successional characteristics that favor northern spotted owls.

The 1,336 acres of PCE3 proposed for treatment represents 15% of the available suitable PCE3 in the project area (See table 18). In the proposed action 328 acres of foraging habitat is proposed for commercial/mechanical treatment this represents $\leq 4\%$ of this habitat type proposed for treatment. The majority of the PCE3 proposed for treatment would be fuels treatments (manual prescribed fire, and underburning) which would represent 11% of the proposed treatments. The fuels treatments would occur over a period of 15 years reducing short-term effects for this habitat type. Even though the proposed treatment areas will remain suitable immediately post-treatment, 7,814 acres (85%) of suitable foraging habitat in the action area will remain untreated.

Dispersal Habitat (PCE 4)

The survivorship of northern spotted owls is likely greatest when dispersal habitat most closely resembles nesting, roosting, and foraging habitat, but owls may use other types of habitat for dispersal on a short-term basis. Dispersal habitat, at a minimum, consists of stands with adequate tree size and canopy cover to provide protection from avian predators and at least minimal foraging opportunities. The minimum requirement for dispersal-only habitat is forests composed of at least 50 percent of trees with 11 inches dbh or greater and a minimum 40 percent canopy cover.

Although NSO use N/R and F as dispersal habitat, here we define dispersal-only as conifer forest types that fall below the definition of foraging but still meet the criteria for dispersal.

Of the 37, 447 acres of critical habitat within the action area, 6,545 acres are suitable dispersal habitat, and 977 acres of suitable dispersal habitat are proposed for treatment (Table 19).

Approximately 415 acres of dispersal habitat is proposed for commercial thinning (ground based, road based, cable units), 429 acres of dispersal habitat is proposed for fuels reduction treatments (manual Rx), and 133 acres of dispersal habitat is proposed for Underburn treatments. These proposed treatments will accelerate the development of late-successional characteristics that favor northern spotted owls and protect existing suitable habitat.

In addition the units are very low quality dispersal habitat because they are densely stocked with little space for an owl to fly through. Thinning will reduce stand density; however post-treatment canopy cover will be maintained at 40% or greater. These stands will be immediately improved as dispersal habitat post treatment.

There would be no downgrade or removal of dispersal habitat due to commercial, or fuels reduction activities. Habitat removal would occur during road and landing construction see roads and landings below.

Fuels reduction activities may modify suitable NSO dispersal PCE4; however, but the treated habitat would remain suitable post-implementation.

- Roadside fuelbreaks and Ingress/Egress fuelbreaks (300 feet each side of the road) would retain approximately 30 percent of uncut understory vegetation to provide cover for other wildlife species. Leave about 30 percent of existing understory vegetation in a mosaic pattern that feathers more leave patches in the latter half (150 feet to 300 feet) of the

fuelbreak (See Appendix B for more detail of prescriptions). The proposed treatment would modify but maintain dispersal habitat.

- Shaded fuelbreak construction may occur in suitable TES habitat. No overstory trees or overstory canopy would be removed; however, in areas where the existing overstory canopy closure is low (but greater than 40%) treatments in secondary or understory canopy layers should maintain a minimum overall canopy closure of 60 percent. The proposed treatment would modify but maintain dispersal habitat.

Fuel treatments are designed to reduce the risk of fire disturbance on a large scale. Although multi-layered conditions contributing to dispersal PCEs would be slightly reduced by removing brush and understory trees (4"-8" dbh or less) within 50-300 ft. of a road, treatments would result in a greater assurance of long-term maintenance of existing late-successional habitat within the action area. Fuel treatments in strategic areas along high-use roads would reduce the risk of fire ignitions along high use roads and provide greater protection to adjacent late-successional habitat. This will protect and enhance owl Critical Habitat in the long run.

Temporary road construction totaling 0.6 miles and landing construction (30 new landings) will remove Dispersal habitat in the project area. These areas will be scattered across the project area, represent small forest openings, and will be areas approximately .25 acres in size. A total of 58 acres would be removed during implementation of the project (See table 20). All temporary roads and associated landings will be "put to bed" after project activities are complete.

Canopy closure in all other treatment areas will be maintained at a minimum of 40%. Thinning currently unsuitable stands of dense, young plantations is expected to provide additional dispersal habitat.

The 977 acres of PCE4 proposed for treatment represents 15% of the available suitable PCE4 in the project area (See table 18). In the proposed action 415 acres of foraging habitat is proposed for commercial/mechanical treatment this represents $\leq 6\%$ of this habitat type proposed for treatment. The proposed treatment for fuels treatments (manual prescribed fire, and underburning) which would represent 0% of the proposed treatments. The fuels treatments would occur over a period of 15 years reducing short-term effects for proposed treatment within this habitat type. Even though the proposed treatment areas will remain suitable immediately post-treatment, 5,569 acres (85%) of suitable dispersal habitat in the action area will remain untreated in this proposed project. The acres treated will maintain current habitat function and maintain a minimum of 40% canopy closure, effects to dispersal PCE will be insignificant.

Subunit K LW 6

Approximately 117, 541 acres of Unit 9, Klamath West Subunit 6 occurs on the Six Rivers National Forest with 2,867 acres of Subunit K LW6 located in the Somes Bar Integrated Fire Management Project NSO action area. There are approximately 60,265 acres of NR, 29, 536 acres of F-only, and 8,003 of dispersal-only habitat in the Six Rivers portion of K LW6.

The portion of KLV6 that is located in the NSO action area will not receive proposed treatments. The NSO habitat PCEs in KLV6 would remain the same post-treatment of the Somes Bar Integrated Fire Management Project.

Subunit KLV7

Subunit KLV 7 has approximately 254,464 acres. The Klamath National Forest manages 135,407 acres of this subunit. The Six Rivers National Forest manages 119,057 acres of this subunit. Approximately 34,580 acres of this Subunit occur within the action area. Within the action area there are approximately 12,662 acres of N/R, 8,679 acres of F, and 6,013 acres of dispersal-only habitat in KLV 7 on both forests. This project and the proposed treatments meet the recommendations of and are consistent with the 2012 CHU (and 2011 RP).

Habitat Modification, Noise and Smoke

Habitat modification, noise and smoke generating activities that occur within or adjacent to suitable northern spotted owl habitat has the potential to disturb nesting owls. To avoid disturbance, design features and limited operating periods (LOPs) would be implemented as described in the project design features in Chapter two of the EA.

Direct Injury or Death

Surveys to the most current, 2012 USFWS approved-protocol have been conducted throughout the project area, and 10 northern spotted owl territories have been identified. No treatments will occur within the 70+-acre nest groves established around each known activity center and no commercial activities will occur in high quality nesting/roosting habitat. Limited operating periods have been established for all activities within 0.25 miles of each activity center. Updated surveys will be maintained throughout the life of the project or additional limited operating periods will be implemented on activities within 0.25 miles of nesting/roosting habitat without up-to-date surveys. There is a low likelihood that direct injury or death could occur to an individual northern spotted owl during the implementation of the management activities.

VI. EFFECTS OF THE PROPOSED ACTION

Northern Spotted Owl

A. Direct and Indirect Effects

Overview

Treatments are expected to benefit NSO by increasing stand complexity and can contribute to reducing threats of habitat loss primarily by:

- creating mosaics of small openings,
- leaving clumps of unthinned areas,
- removing competing conifers from around large and late seral hardwoods and conifers,
- retaining small groups of closely-spaced trees within the thinned areas,
- creating openings around individual and groups of hardwoods for future recruitment,

- stimulating herbaceous growth,
- and retaining age, size, and species diversity.

Thinning units are spatially distributed across the Project Area, occurring in groups of units or solitary units varying in size from 2 to 78 acres. Trees selected for thinning are co-dominate or smaller; fuels treatments will either be handpiled, lop and scattered, and/or underburned. The canopy will be more open along ridgetops or south facing slopes. Snags may be reduced but only for human and operational safety. Yarder cable corridors and skid trails in the tractor units will create small openings but these openings will not preclude the use of the habitat by NSO, however, these openings may directly affect NSOs or their prey during or indirectly in the short term following treatment (described below). Where thinning and prescribed fire treatments similar to those proposed in this project have been studied, the effects to small mammal species' diets and small mammal biomass have been shown to be insignificant or of short duration (Monroe and Converse 2006; Manning and Edge 2008; Suzuki and Hayes 2003). The action is expected to be implemented over an approximately a fifteen year period beginning in 2018, with the elements of commercial/non-commercial treatments likely occurring over the first five years, followed by prescribed burning and pile burning in subsequent years. Table 20 summarizes the proposed activities, in NSO habitat and acres type.

Habitat and Treatment Summary

The Somes Bar Integrated Fire Management Project footprint is 5570 acres, representing 12% of the 46,243 acres in the Action Area proposed for treatment. The Somes Bar Integrated Fire Management Project proposes to treat approximately 1234 acres of commercial thinning, 2658 acres of manual fuelbreak treatments, 187 acres of mastication treatment and 1491 acres of prescribed fire (Table 21). Table 20 portrays the NSO habitat type and acres treated by the proposed action. These acres would be treated multiple times with phased entry implementation.

Table 21. Acres treated of NSO Habitat Type by Proposed Action

Sum of GIS_ACRES	NSO_HAB_WKRP_Review						Grand Total
Proposed Action	NO	D	F	NR	NR LMQ	NR HQ	
Manual	688	377	853	463	189	88	2658
Mastication	61	106	20	0	0	0	187
Mechanical - cable	15	37	20	0	32	0	103
Mechanical - ground-based	162	421	344	0	118	13	1058
Mechanical- road-based	18	15	31	0	8	1	73
Prescribed Rx Burn	284	180	567	370	81	9	1491
Grand Total	1227	1136	1835	834	427	111	5570

The Somes Bar Integrated Fire Management Project will treat approximately 1835 acres of foraging habitat and 1372 acres of nesting/roosting habitat (834 acres NR, 427 acres LMQNR and 111 acres of HQNR) in the four project areas (Table 20). The remaining acres are considered dispersal or non-habitat. The proposed treatment prescription for unoccupied HQNR habitat would be cut, pile and burn material ≤ 4 inches and/or a low intensity underburn. The areas HQNR habitat included in the above table for commercial treatments (14 acres) and manual and RX burn (89 acres) will be flagged on the ground and would include the prescription mentioned above (cut, pile, and burn material ≤ 4 dbh and/or a low intensity underburn). All mapped HQNR habitat within the

project area would receive this treatment. In the four core areas that are deficient for NR habitat, an 18 inch dbh or less will be prescribed in specific mechanical based treatments. Units containing mastication and dispersal (plantations) only habitat would not have an 18 inch dbh restriction. The project will retain at least 60% canopy cover post-treatment in NR habitats and at least 40% canopy cover in F and D habitats throughout the four project areas. For unit by unit treatments in habitats see **Appendix E** for Unit Descriptions and **Appendix F** for Pre- and Post-Treatment acres.

Commercial/Mechanical Thinning

Commercial Plantations- Suitable NSO habitat currently does not exist within plantations, so habitat will not be directly affected. The current dense stand conditions of the se plantations limits use by NSO; the variability created by the proposed action would facilitate foraging, especially after 10-15 years as tree crowns begin to fill in. Foraging in the short term is likely to be facilitated along plantation edges where they are adjacent to higher quality habitat. Long-term benefits to NSO would be realized through the increased species and structural complexity, improved resilience to mixed severity fire. All of these proposed treatments would modify but maintain habitat suitability. Approximately 473 acres of dispersal habitat would be commercially thinned with the proposed action (See table 20) within plantations. Additionally 106 acres of dispersal habitat is proposed for mastication treatments.

Commercial Non-Plantation –The treatments are expected to retain or improve stand structure so that conditions will be more conducive for short and long-term NSO use.

Of the commercial thinning acres, 158 acres of nesting/roosting is proposed for commercial treatment. This represents one percent of the 15,369 acres within the Action Area. Of the commercial thinning acres, 415 acres of foraging habitat is proposed for commercial treatment. This represents three percent of the 12,615 acres within the Action Area. Of the commercial thinning acres, 579 acres of dispersal habitat is proposed for commercial treatment. This represents seven percent of the 8,047 acres within the Action Area. Treated acres are distributed in mosaics within stands and across the project area.

Commercial thinning treatments occurring in suitable habitat represent a very small component of the project. These treatments are focused on removing the concentration of co-dominate or smaller material in and around large late successional trees and are expected to reduce the potential for habitat loss resulting from high fire behavior. Habitat will be modified but maintained and will not be downgraded or removed.

Short-term effects: Canopy closure and understory structure will be more variable in treatment stands. Prescriptions will maintain a minimum average canopy cover of 40 percent in NSO foraging habitat and dispersal habitat and 60 percent canopy cover in nesting/roosting habitat. In general, stands on ridges and south facing slopes will be more open than will the north facing units and units situated on lower slope positions. Modeled canopy closure values are to be considered as a generality and not to be relied on for accuracy or a fixed target; the existing stand conditions combined with a highly variable silvicultural prescriptions presents challenges with model results. “Gaps” created by the prescription will result in small openings in the canopy (especially around existing large

diameter California black oaks) and “skips” will retain untreated dense patches. The variable thinning and “skip” and “gaps” would create small openings and will shift some stands from shade-tolerant Douglas fir dominated stands, increasing areas receiving sunlight. This in turn would have short and long-term benefits to herbaceous growth and for the establishment and growth of hardwoods such as black oak and conifers such as sugar pine and ponderosa pine. NSO habitat will be retained or improved by creating mosaics of thinned and unthinned patches with much less uniformity. Projected basal area of trees less than those harvested will be reduced, but post-treatment stands will be highly variable and will be within the range associated with owl use.

Stand-level and landscape-level structural diversity will increase following treatments due to the variable spacing regime, and to some degree due to the variable nature of the treatments. Vertical structural diversity will be retained in non-plantation stands and will increase to some degree in the long term in plantations as trees become established and begin to grow due to the more open conditions.

Predominate and dominate trees will be retained unless deemed necessary for safety purposes, therefore there are no expected losses to the late seral component of NSO habitat. Platform structures caused by dwarf mistletoe are important to many species of wildlife for cover, nesting, resting platforms, and as a food source (Bull et al. 1997). These structural elements will be retained within the project.

Structural changes to stands may result in short term negative effects to NSO prey species with longer term benefits. The short term effects would be limited to the season of operation and limited in scope, therefore are not expected to affect overall prey population; largely because of the spatial and temporal variation in the thinning. Effects to prey species important to NSO such as northern flying squirrels may occur due to the increase in small openings, but are not expected to be significant due to the retention of predominate and dominate trees. Retention of these trees will ensure an overall connectivity in the canopy and would not be expected to significantly affect their gliding or movement capability. In an analysis of multiple fuels reduction projects, Converse et al. (2006) found responses of individual small-mammal biomass should increase with thinning, prescribed fire, or thinning and prescribed-fire combination treatments. This in turn would provide to benefit NSO. The changes proposed for the Somes Bar Integrated Fire Management Project would diversify stand structure but would not appreciably change it.

Increased heterogeneity will occur at the stand and landscape scale due to the variable density thinning design and the spatial distribution of treatment units between and untreated areas throughout the Project Area. Suitable habitat will not be downgraded, or removed because existing late successional elements such as large trees and coarse wood will be retained and the overall canopy closure at the stand level will not be significantly affected. The degree of change proposed by the treatments is not expected to preclude the use of stands for foraging or roosting by NSO.

Long-term effects: The longer-term effects to NSO habitat are focused on stand level improvements which are expected to be representative of historical vegetative conditions

found in the Western Klamath Physiographic Province. Treatments will attempt to create the variable stand conditions that would have been formed if frequent low-intensity fires would have occurred over the last century. The treatments will reduce the numbers of conifers in the smaller size classes and decrease competition-related stress on, and mortality of, remaining trees until stand stocking increases to the point at which trees again begin to die. Lower levels of surface fuels will be obtained from the reduction in mortality and removal of smaller trees. Existing late-successional habitat in terms of the retention of large and/or old trees will be maintained, in addition to an increase of stand complexity. Reduced stocking will increase the vigor, rate of decline, and death in large trees presently within the treated stands and will likely retain these features on the landscape for a longer period. The more direct long-term benefits from this action are improving stand resilience and fostering a higher potential for long-term retention of the late successional elements such as the large black oaks.

Manual Fuels Treatments

Prescribed fire would decrease surface and ladder fuels in strategic locations such as major ridges, within thinning units and within stands that were not commercially treated. Combined, these efforts would contribute to protecting the larger blocks of late-successional habitat and increasing the landscape's resilience to severe wildfires, and return fire to the ecological system. Small openings created by single tree mortality or small groups of co-dominate trees are well described in the literature as one of the significant ecological processes in the development and maintenance of forest structure (as reviewed in Franklin et al 2002). Effects of prescribed fire to wildfire are variable and somewhat unpredictable. Direct effects of underburning will depend on season of burn, fuel moisture content, vegetation, and topography. Short-term, direct impacts of fire during the active combustion stage may include injury or death of less mobile wildlife species, loss of food and cover, and increased exposure to predation. Responses of small mammals to fuel reduction treatments depend upon the impacts to their habitat components, including shrubs, herbaceous vegetation and coarse woody debris. (Converse et al. 2006).

Of the manual fuels treatments acres, 1,214 acres of nesting/roosting is proposed for manual fuels treatments. This represents eight percent of the 15,369 acres within the Action Area. Of the manual fuels treatment acres, 1,420 acres of foraging habitat is proposed for manual fuels treatments. This represents eleven percent of the 12,615 acres within the Action Area. Of the manual fuels treatments acres, 557 acres of dispersal habitat is proposed for manual fuels treatments. This represents seven percent of the 8,047 acres within the Action Area. Treated acres are distributed in mosaics within stands and across the project area.

Forestwide, an average of 660-1,000 acres of prescribed fire is implemented per year due to limitations in burning "windows", staffing and logistics (SRNF Fuels pers. Comm.). With such limitations, it is likely that successful completion of the prescribed fire component is likely to be spread over a long period of time. Due to the short-term and limited nature of these effects described above, combined with spatial and temporal project design standards these direct and indirect effects to NSO in this landscape are not expected to be significant.

Landings

There are 160 landings proposed to implement the Somes Bar Integrated Fire Management Project, 130 existing and 30 new. These landings occur along roads and within the mechanical/commercial thin, manual/fuel, and prescribed burn units. Of the 160 landings, 67 occur in dispersal habitat (approximately 40% of landings), 35 occur in foraging habitat, 7 occur in nesting/roosting habitat and 51 occur in non-habitat types designated for northern spotted owls. For the 30 new landing occurring in all habitat types, an estimated 3.6 acres of NRF will be modified (Table 22).

Table 22. Action Area Habitat Affected by Landing Construction

NSO Habitat	Number of Landings Existing/New	Acres Removed within Action Area. Existing/New Landing Construction
Foraging	27/8	5.0/1.6
Nesting/Roosting	1/6	0.4/2.0

Roads Construction

A total of 0.54 miles of new roads are proposed in the Somes Bar Integrated Fire Management Project and all occur in dispersal habitat or non-habitat designated for northern spotted owls. The 0.54 miles of new road will result in 1.06 acres of removal of dispersal habitat, 0.1 acres of foraging habitat and 0.2 acres of nesting/roosting habitat (Table 23).

Table 23. Action Area Habitat Affected by Temporary Roads, Existing and New.

NSO Habitat	Number of Temp Roads Existing/New	Acres Removed within Action Area Existing/New Road Construction
Foraging	5/1	0.8/0.1
Nesting/Roosting	5/2	0.8/0.2

Summary of NSO habitat effects within the Action Area due to landing and road construction:

- Proposed construction of landings within deficit owl cores would remove .1 acres of foraging habitat within the core of AC1073. Within remaining deficit NSO cores landing construction will not remove or downgrade suitable NRF habitat (See Appendix D).
- Construction of roads new/existing would not remove NRF habitat within deficit owl cores.
- Proposed construction of landings and roads within non-deficit owl home ranges will occur (See Appendix D & E for specific locations).
- Within the Action Area 3.4 acres of NR habitat would be removed for proposed landing and road construction both existing/new. Within the Action Area 7.5 acres of foraging habitat would be removed for proposed landing and road construction both existing/new.

Ingress/Egress roads

Safe and reliable ingress and egress routes will be maintained by manual, mechanical and prescribed burning treatments that are critical safety routes with a 300-foot buffer and be a complete road system for both public and private access. The acreage reported in Table 24 is not additional acreage treated but represents proposed action treatment by NSO habitat type for the

ingress/egress 300-foot buffer in the four project areas. Proposed treatments within these habitat types will not be downgrade or remove suitable NSO habitat.

Table 24. Treatment by NSO Habitat Type for Ingress/Egress Roads

Proposed Action	NSO Habitat Type						Grand Total
	D	F	NO	NR	NR HQ	NR LMQ	
Manual	202	436	367	113	54	160	1331
Mastication	27	4	11	0	0	0	43
Mech - cable	16	13	9	0	0	21	60
Mech - ground-based	202	167	97	0	9	56	530
Mech - road-based	15	29	15	0	1	8	67
Rx Burn	2	5	29	1	0	0	37
Grand Total	464	654	527	114	63	244	2067

Strategic Fuelbreaks

Proposed strategic fuelbreaks and handlines would be constructed using hand-held tools (such as, chainsaws, loppers, shovels, and McLeod's), have limited impact on canopy closure and do not create significant ground disturbance near riparian reserves that could lead to off-site sedimentation. These actions are limited in scope, primarily located on ridgetops away from inner riparian reserves. Strategic fuelbreaks are designed to facilitate planned and unplanned ignitions, and as such would be maintained throughout the life of the project. Fuelbreaks require minimal soil disturbance. An approximately 2-foot-wide scrape (supported with 100-foot thinning of ladder fuels) is the actual ground disturbance associated with these features. As mentioned before under manual treatments, thinning of small diameter trees is not a ground disturbing action. Fuelbreaks would have water bars installed at the appropriate spacing, dependent on slope steepness, to prevent erosion and subsequent sedimentation during the rainy season. Handlines also have a 2-foot-wide scrape, but are supported with only a 6-foot-wide brush cut and are more of a temporary feature designed and located to support planned ignitions.

The strategic fire line establishment has a proposed linear distance of 105,524 feet of Ridgetop modified shaded fuel break that would total 229.8 acres and 145,298 feet of handlines for 17.2 acres with associated brush cut buffers in the four project areas (Table 25). Ridgetop shaded fuelbreak treatments would modify but maintain habitat that are considered suitable for late successional associated species. The proposed treatment for segments of the Ridgetop shaded fuelbreak within HQNR habitat would be cut, pile, and burn material ≤ 4 inch dbh. All of the proposed treatment within the described habitat types are not additive acres to the project and are accounted for in unit prescriptions in table 7. Proposed treatments within these habitat types will not be downgrade or remove suitable NSO habitat.

Table 25. Acres for all proposed handline work with brush cut buffers.

Handlines		Shaded Fuel Break	
Habitat Type	Acres	Habitat Type	Acres
F	4.3	F	84.2
NO	3.6	NO	46.9
NR	2.6	NR	25.5
NR HQ	0.3	NR HQ	6.9
NR LMQ	1.3	NR LMQ	15.7
Grand Total	17.2	Grand Total	229.8

This project has protected all high quality habitat (not just old-growth, but also late mature and some mid mature stands, RA32), all spotted owl territories (not just high priority sites, RA10) and is designed to restore and accelerate important habitat characteristic for the spotted owl (RA6) and protect existing suitable habitat from stand replacing fire. Such long-term restoration and protection of owl habitat is consistent with the recommendations in the 2011 Recovery Plan.

Table 26 presents acres and habitat type proposed for treatment within Critical Habitat and acres and habitat type proposed for treatment within the action area.

Table 26. Summary of Treatments and Affects to NSO Habitat within the Somes Bar Integrated Fire Management Project.					
Critical habitat within Action Area (37,447 acres)			Habitat within Action Area (46,243 acres)		
Habitat Type	Acres	% of Habitat Type Treated	Habitat Type	Acres	% of Habitat Type Treated
Dispersal	6,545	977 acres/15%	Dispersal	8,047	1,136 acres/14%
Foraging	9,150	1336 acres/15%	Foraging	12,615	1,835 acres/15%
Nesting/Roosting	14,157	1241 acres/9%	Nesting/Roosting	15,369	1,372 acres/9%
Critical Habitat Removed within Action Area			Habitat Removed within Action Area		
Dispersal - 58 acres	Foraging - 5.9 acres	N/R -3.3 acres	Foraging -7.5 acres	N/R -3.4 acres	

Effects to Known NSO Activity Centers

Ten historical or currently known activity centers 1.3 mile home ranges overlap with proposed activities. Four of these activity centers have proposed activities within 0.5 mile core areas. Refer to Appendix D & E for a list of the NSO activity centers, and proposed habitat treated in the 0.5 and 1.3 mile core and home ranges areas.

Indirect Effects

Marijuana Propagation

The cultivation of marijuana in northern California on both public and private lands has been identified to harm wildlife species with target and non-target poisoning by use of rodenticides (Gabriel et al. 2012), as well as significant impacts to natural flow into creeks and rivers (Bauer et al. 2015). Risk assessment have led to restriction of some second-generation anticoagulant rodenticides in North America (Rattner et al. 2014), but would not apply to the illegal use of these banned rodenticides. Multiple pathways of exposure and sub lethal effects are still in need of further investigation to determine threats to non-target, predator-prey relationships (Rattner et al. 2014).

Recent data has been reported for impacts of rodenticides and other pesticides used in illegal cultivation of marijuana on northern spotted owls, the likelihood of non-target exposure could be of conservation concern (Gabriel et al. 2018, Franklin et al. 2018). Review of the project using aerial photos in google earth does not indicates any potential for marijuana cultivation sites on private land less than a mile from the proposed Somes Bar Integrated Fire Management Project boundary. Improper and illegal use of pesticides and rodenticides have been found in expose northern spotted owls and invasive barred owls (Gabriel et al. 2018, Franklin et al. 2018).

Barred Owl

Many studies have found negative correlations between NSOs and barred owls where they co-occur but the effect of forest management on barred and spotted owl interactions is not well documented. The expansion of the barred owl (*Strix varia*) west of the Rocky Mountains and into the range of the northern spotted owl is posing an increased threat to the native species. Recent meta-analysis of 11 study areas demonstrates an associated increase of local extinction rates of northern spotted owls if barred owls are present. The research also found negative effects of barred owl presence on the colonization rates in 5 of the 11 study areas for northern spotted owls. The potential for impacts to northern spotted owl prey-based has been suggested as an additional cause of concern that the barred owl poses (Dugger *et al.* 2016).

Summary

The project will not adversely affect the NSO due to: 1) no suitable NSO habitat will be downgraded, and all such habitats will maintain their functionality post-treatment; 2) the maintenance of snags and downed logs within the treatment units which would provide potential foraging perches and prey species habitat if NSO do forage; and 3) LOPs will be used unless current year surveys release the LOPs. 4) No NSO will be taken due to habitat alteration or disturbance.

B. Cumulative Effects

Cumulative effects include the effects of future, State, local or private actions that are reasonably certain to occur in the planning area. Future federal actions that are unrelated to the proposed action are not considered because they require separate consultation pursuant to Section 7 of the Endangered Species Act.

The CalFire web site which contains the list and location of all THPs was checked on February 5th, 2018. There are no planned timber harvest plans (THP) currently in or near the project area. Private land activities include agriculture (and possible marijuana propagation, both illegal and legal), grazing, domestic use, timber harvest, and fuel treatments. Timber harvest has occurred and is expected to continue on the corporately owned timber ground. Impacts from the proposed project are considered to be minor, and therefore will not create adverse effects when combined with past activities on the Forest and those on adjacent private land.

The protective measures described in the project design standards minimize the risk of adverse cumulative effects to Threatened, Endangered, and Forest Service Sensitive species and their habitats.

VII. DETERMINATION

The following conclusions led to my final determination of the effects that the proposed Somes Bar Integrated Fire Management Project would have on federally listed species.

Northern Spotted Owl: Based on the above assessment of direct, indirect, and cumulative effects, it is my determination that the implementation of the Alternative 2 “**may effect, but is not likely to adversely affect NSOs or Critical Habitat.**” This determination is based on the following factors:

- The proposed thinning portions of the project will not remove or downgrade suitable nesting/roosting or foraging northern spotted owl habitat. Habitat will be ‘maintained’ meaning it will retain the function, or result in improved stand condition for NSO use, following treatment. These treatments are not likely to interfere with the NSO’s ability to breed, feed, or shelter.
- Suitable habitat will not be removed or downgraded because existing late successional elements will not be removed, nor will the degree of change proposed by the treatments preclude the use of stands for foraging or roosting. The treatments overall are expected to retain or improve stand structure so that conditions will be more conducive for short and long-term NSO use.
- Construction of temporary roads and landings may remove habitat, but these small openings scattered across the project area and removal of habitat is insignificant in scale and will not impair NSO from nesting, foraging or roosting.
- All home ranges are not deficit in NRF habitat and proposed treatments (commercial and fuels) will not remove or downgrade NSO habitat within the 1.3 mile home ranges.
- Application of Project Design Features are expected to minimize effects to NSO habitat and the likelihood that NSOs will be harassed, killed or injured during project implementation.
- Proposed treatments (commercial and fuels) will not remove or downgrade nesting/roosting or foraging habitat in the deficit 0.5-mile NSO core areas.
- Due to the spatial and temporal distribution (about a fifteen year period) of implementation, the short-term nature of direct and indirect effects, these effects are not expected to be significant to NSO.

- Improved structural diversity and heterogeneity is expected at the treatment unit and landscape scale, thereby resulting in beneficial effects.
- Effects on NSO prey species are expected short-term; but treatments are likely to have long-term beneficial effects on prey species from treatment activities;
- Combined effects of density reduction treatments and prescribed fire will have long-term beneficial effects by reducing the potential for loss of habitat due to high intensity wildfires.

NSO Surveys will be conducted prior to implementation. The project is consistent with the 2012 NSO Critical Habitat Rule and the 2011 Recovery Plan.

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Appendices

Appendix A: Biological Assessment/Evaluation: Threatened, Endangered, Proposed, and Forest Service Sensitive Species: Forest-wide Reference Document.

Appendix B. Somes Bar Integrated Fire Management Project prescriptions

Appendix C: Phasing of treatments by treatment category, harvest method, prescription, pre- and post-treatment canopy cover ranges for each unit.

Appendix D: Four activity centers with core areas in the project areas.

Appendix E: Six activity centers that do not have core areas in the project areas.

Appendix F: Unit descriptions.

Appendix G: Pre- and post-treatment acres.

Appendix H. Maps of Project Design Features in Ti Bar, Patterson, Rogers Creek and Donahue Project Areas.